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ABSTRACT

The clinic process for teaching improvement is a systematic process based on the needs of individual faculty participants. It includes the identification of specific instructional strengths and problem areas. In addition to using consultation with a teaching specialist, the process uses a student questionnaire called Teaching Analysis By Students (TABS) for assessment. Specific skills are selected as foci for improvement, and the working definitions of those skills are provided in this manual. The TABS questionnaire and an explanation of the teaching skills approach are included. (MSE)

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Clinic to Improve University Teaching

Working Definitions of Some Technical Skills of Teaching

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The Clinic to Improve University Teaching

University of Massachusetts

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CLINIC TO IMPROVE UNIVERSITY TEACHING:
A TEACHING IMPROVEMENT PROCESS

Since 1971, the Clinic to Improve University Teaching has been developing, testing, and continuously revising a systematic process for teaching improvement that is based on the needs of individual faculty participants. This process involves the identification of specific instructional strengths and problem areas through the collection of information from a variety of sources and the consultation services of a trained Teaching Improvement Specialist. After deciding which teaching strength to develop or which problem to attack, the Teaching Improvement Specialist and the faculty member work together to devise and implement a variety of teaching improvement strategies. Following the implementation of these strategies by the faculty member, the Teaching Improvement Specialist aids in the recollection of data and the assessment of improvement efforts.

The process begins with an initial interview in which the Teaching Improvement Specialist responds to questions concerning the improvement process and collects information about the faculty member's own classes, objectives, and interests. Additional data is collected using classroom observation, videotape, a student questionnaire (TABS*) on which the students assess the amount of improvement needed for specific teaching skills, the self-assessment and prediction of student responses by the faculty member on the same questionnaire, and the examination of course syllabi, examinations and/or assignments. The data collection portion of the process will generally take 45 to 90 minutes of the faculty member's time and about 20 minutes of class time.

After the results of the TABS questionnaire, the faculty member's own self-assessment, and his/her prediction of student responses have been processed and printed by the computer, the Teaching Improvement Specialist and the faculty member meet to compare and discuss the various data sources. Together they identify the instructor's relative instructional strengths and weaknesses and select specific skill areas as the best foci for the improvement strategy phase of the process. This data review and negotiation process usually involves 60 to 90 minutes of the instructor's time outside of class.

The faculty member then has available an assortment of teaching improvement options. The Teaching Improvement Specialist serves as a facilitator in the selection and design of these options by drawing from an existing bank of empirically or experientially validated teaching strategies or by helping the faculty member to develop strategies and materials as they are needed. Improvement strategies range from simple experimentation within the classroom using easily undertaken teaching techniques, to training in instructional skills through microteaching, to the repeated use of classroom practice-observation-critique cycles.

Training strategies are generally used in conjunction with monitoring procedures--or ways of collecting information about the use of the strategy and its effect in the classroom. Monitoring strategies include various types of student questionnaires and tests of learning, the use of videotape or audiotape, the conducting of interviews with students or significant others, and classroom observation and feedback by the Teaching Improvement Specialist. Improvement strategies, whether training or monitoring, vary substantially in the amounts of time demanded of faculty members. The time spent on improvement strategies is always negotiated, but usually will range from five to ten hours.

In the case where the entire department is the client rather than an individual faculty member, the improvement strategy phase of the improvement process is undertaken on a group basis. Data collected from the individuals involved in the project is synthesized in order to determine suggested foci for departmental change. Negotiations with the faculty participants as a group are utilized to determine the exact nature and design of the improvement strategies in this portion of the process.

After a significant period of implementation of the devised strategies, data is again recollected in order to assess the efforts of the faculty member and the Teaching Improvement Specialist. This will ordinarily take up another 20 minutes of class time and 60 to 75 minutes of instructor time. Students are asked to look closely at their instructor's teaching skills for evidence of improvement while the faculty member assesses his/her own improvement in the performance of those instructional skills targeted during the data review session. During a wrap-up interview, the instructor is asked to provide a written and oral critique of the Clinic Process, the improvement strategies utilized, and the helpfulness of the Teaching Improvement Specialist.

Although the steps of the Clinic Process as outlined here may suggest a fixed, inflexible approach to teaching improvement, the final choice of activities is made by the faculty member based on his/her needs, interests, and time commitments. S/he may wish to end the Process after the initial collection of data, after the analysis of that data, or after the implementation of a single improvement strategy. The steps of the process can also be easily adapted for use in group settings, auto-tutorial improvement efforts, or peer consulting situations.

CLINIC TO IMPROVE UNIVERSITY TEACHING

Teaching Skills and Behaviors: Definitions and TABS Items

The first thirty-eight items on the TABS questionnaire were generated by members of the Clinic staff to provide information on twenty teaching skills extracted from a review of 1) published literature in the field of teaching; 2) inductive studies of effective teaching; and 3) research in the area of higher education. These twenty skills are not meant to be either exhaustive or comprehensive. Instead, they should be considered as take off points for the discussion of both individual teaching performance and the broader issues of teaching and learning.

1) Learning Set: the instructor's ability to clarify, communicate and arouse interest in instructional goals. (TABS items 1, 2, and 3)
2) Logical Organization: the instructor's skill in arranging and presenting course content and learning activities so that students understand the relationships between the various objectives, topics, issues, activities, etc. included in the course. (TABS items 5, 6, and 7)
3) Pacing: the instructor's skill in adjusting the rate at which material is covered in order to maximize student comprehension. (TABS item 8)
4) Elaboration: the instructor's skill in clarifying or developing an idea or topic. (TABS item 9)
5) Expression: the instructor's skills in using verbal (voice tone, inflection, pitch emphasis) and nonverbal (facial expressions, gestures, body movements) behaviors to increase the power and meaning of his/her communication. (TABS item 10)
6) Asking Questions: the instructor's ability to use different types of questions for a variety of instructional purposes, for example, to check for comprehension, to increase student participation, to assist students in developing critical thinking skills, etc. (TABS items 11 and 12)
7) Responding to Questions: the instructor's ability to answer questions concisely and clearly. (TABS item 13)
8) Student Participation: the instructor's skill in facilitating student involvement in class discussions both with the instructor and among students. (TABS items 14, 15, and 16)
9) Closure: the instructor's ability to provide for the clarification of major points at the conclusion of class sessions or units or work in order to assist students in the memory and synthesis of new material. (TABS items 17 and 18)
10) Evaluation: the instructor's skill in specifying criteria for the assessment of learning, in designing testing and grading procedures which are consistent with course objectives, and in providing adequate feedback to students about their progress in achieving course objectives. (TABS items 4, 19, 20, and 21)
11) Level of Challenge: the instructor's skills in selecting and using course objectives, content and activities which challenge students' abilities without being too difficult. (TABS items 22, 23, and 29)

12) Variety: the instructor's skill at selecting and using an appropriate variety of teaching methods and materials. (TABS items 24 and 25)
13) Creativity: the instructor's ability to combine methods and materials in new and unusual ways. (TABS item 26)
14) Classroom Management: the instructor's skill in performing those organizational and administrative tasks that allow instruction to proceed smoothly, (e.g., distributing hand-outs, correcting and returning exams, etc.). (TABS item 27)
15) Flexibility: the instructor's ability to recognize and deal with the differing interests and abilities among students both in and out of class. (TABS items 28 and 30)
16) Interpersonal Relations: the instructor's ability to relate to students in ways which promote mutual respect. (TABS item 31)
17) Learning Environment: the instructor's ability to create and maintain an atmosphere conducive to student involvement and achievement. (TABS item 32)
18) Enthusiasm: the instructor's abilities to conduct and direct learning activities in such a way as to stimulate interest in course content and activities. (TABS item 33)
19) Perspective: the instructor's ability to establish a frame of reference for course content and to encourage students in developing processes of intellectual inquiry. (TABS items 34, 35, and 36)
20) Value Context: the instructor's ability to explore value issues inherent in his/her selection, application, and/or interpretation of subject matter and to assist students in the exploration of their own values and the implications of those values for their personal and professional conduct. (TABS items 37 and 38)

Teaching Analysis By Students

[TABS]

The Clinic to Improve University Teaching is working with instructors to improve the quality of teaching which they offer to their students. The Clinic is designed to help instructors identify and effectively use their particular teaching strengths, to isolate their specific teaching problems, and to develop improvement strategies directed at these problems.

In order to identify these strengths and problems, we are collecting information about teaching in this course by discussing course objectives and teaching patterns with your instructor, by observing and video-taping some classes, and by asking for student opinions about performance on some specific teaching skills and behaviors. The information will be used to obtain a clearer understanding of specific teaching strengths and weaknesses so that your instructor can work toward improvement. Thus, your responses will be of most value to your instructor if they are thoughtful and honest. Your cooperation will be very much appreciated.

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Section I—Teaching Skills and Behaviors

In this questionnaire there are some statements concerning a variety of specific teaching skills and behaviors. Please read each statement carefully and then indicate the extent to which you feel your instructor needs improvement. Respond to each statement by selecting one of the following:

1. No improvement is needed (very good or excellent performance)
2. Little improvement is needed (generally good performance)
3. Improvement is needed (generally mediocre performance)
4. Considerable improvement is needed (generally poor performance)
5. Not a necessary skill or behavior for this course

Please make your decisions about the degree of improvement needed on the basis of what you think would be best for this particular course and your learning style. Try to consider each statement separately, rather than let your overall feelings about the instructor determine all the responses.

1. The instructor's explanation of course objectives
2. The instructor's explanation of the objectives for each class session and learning activity
3. The instructor's ability to arouse my interest when introducing an instructional activity
4. The instructor's explanation of the work expected from each student
5. The instructor's ability to maintain a clear relationship between the course content and the course objectives
6. The instructor's skill in clarifying the relationships among the various topics treated in the course
7. The instructor's skill in making clear the distinction between major and minor topics
8. The instructor's skill in adjusting the rate at which new ideas are covered so that the material can be followed and understood
9. The instructor's ability to clarify material which needs elaboration
10. The instructor's speaking skills
11. The instructor's ability to ask easily understood questions
12. The instructor's ability to ask thought-provoking questions
13. The instructor's ability to answer questions clearly and concisely
14. The instructor's overall effectiveness as a discussion leader
15. The instructor's ability to get students to participate in class discussions
16. The instructor's skill in facilitating discussions *among students* as opposed to discussions only between the instructor and students
17. The instructor's ability to wrap things up before moving on to a new topic
18. The instructor's ability to tie things together at the end of a class
19. The instructor's explanation of precisely how my performance is to be evaluated
20. The instructor's ability to design evaluation procedures which are consistent with course objectives
21. The instructor's performance in periodically informing me of my progress

22. The instructor's selection of materials and activities which are thought-provoking
23. The instructor's ability to select materials and activities which are not too difficult
24. The instructor's provision of *variety* in materials and activities
25. The instructor's ability to use a variety of teaching techniques
26. The instructor's demonstration of creativity in teaching methods
27. The instructor's management of day-to-day administrative details
28. The instructor's flexibility in offering options for individual students
29. The instructor's ability to take appropriate action when students appear to be bored
30. The instructor's availability for personal consultation
31. The instructor's ability to relate to people in ways which promote mutual respect
32. The instructor's maintenance of an atmosphere which actively encourages learning
33. The instructor's ability to inspire excitement or interest in the content of the course
34. The instructor's ability to relate the subject matter to other academic disciplines and real world situations
35. The instructor's willingness to explore a variety of points of view
36. The instructor's ability to get students to challenge points of view raised in the course
37. The instructor's performance in helping me to explore the relationship between my personal values and the course content
38. The instructor's performance in making me aware of value issues within the subject matter

Section II—Other Information

Please mark the appropriate response for each of the following items beside the correct statement number on the answer sheet.

39. Class:
    (1) freshman
    (2) sophomore
    (3) junior
    (4) senior
    (5) graduate student
40. Sex:
    (1) male
    (2) female
41. Grade point average:
    (1) less than 1.50 (lowest)
    (2) 1.50-2.49
    (3) 2.50-2.99
    (4) 3.00-3.49
    (5) 3.50-4.00 (highest)
42. In terms of the directions my life is taking, this course is:
    (1) relevant
    (2) somewhat relevant
    (3) irrelevant
    (4) I am unsure

43. In this course I am learning:
    (1) a great deal
    (2) a fair amount
    (3) very little
    (4) I am unsure

44. As a result of this course, my attitude toward the instructor is:
    (1) becoming more positive
    (2) becoming more negative
    (3) unchanged

45. As a consequence of participating in this course, my attitude toward the subject matter is:
    (1) becoming more positive
    (2) becoming more negative
    (3) unchanged

46. I would prefer that this course:
    (1) become more structured or organized
    (2) become less structured or organized
    (3) maintain about the present level of structure

47. Which of the following descriptions of student learning styles most nearly approximates your own? (Choose only one.)
    (1) I like to think for myself, work alone, and focus on learning personally relevant content.
    (2) I prefer highly structured courses and will focus on learning what is required.
    (3) I try to get the "most out of classes," and like sharing my ideas with others and getting involved in class activities.
    (4) I am competitive, concerned about getting good grades, and try to learn material so that I can perform better than others.
    (5) I am generally turned off as a student, uninterested in class activities, and don't care to work with teachers or other students.

48. About how much time and effort have you put into this course compared to other courses of equal credit?
    (1) much more
    (2) somewhat more
    (3) about the same amount
    (4) somewhat less
    (5) much less

49. Generally, how valuable have you found the assigned readings in terms of their contribution to your learning in this course?
    (1) very valuable
    (2) fairly valuable
    (3) not very valuable
    (4) there have been no assigned readings

50. Overall, I would rate this course as:
    (1) excellent
    (2) good
    (3) mediocre
    (4) poor

THE TEACHING SKILLS APPROACH TO THE ANALYSIS AND IMPROVEMENT OF TEACHING

Comparative studies of various instructional methods have failed to demonstrate that any one method is consistently better than any other in improving student achievement (Dubin & Traveggia, 1968; Dunkin & Biddle, 1974; Trent & Cohen, 1973). However, studies of a range of discrete teaching behaviors have produced some consistency of results. The following behaviors have demonstrated over a number of correlational and experimental studies a correlation with gains in student achievement or attitudinal change (Allen & Ryan, 1969; Brophy & Evertson, 1974; Gage, 1975; Hildebrand, Wilson, & Dienst, 1971; Rosenshine & Furst, 1973):

a. organization and clarity
b. variability in instructional procedures and materials
c. task-oriented, business-like behavior
d. indirectness
e. structuring comments
f. multiple levels of questions and discourse
g. warmth or interpersonal relationships with students
h. enthusiasm
i. management behaviors (e.g., pacing, continuity, planning)

The delineation of teaching skills as keys to effective teaching does not imply that other variables in the teaching/learning situation are not equally or more important. The entering behavior, knowledge, and motivation of students; the intellectual climate of the institution; the nature and pacing of student rewards; the various learning styles represented in the class; the subject matter itself; the physical characteristics of the classroom, etc., interact continuously to effect the quality of education produced. Since the instructor cannot hope to control all of these variables and more, one possible approach to the achievement of effective teaching is to focus on one variable over which the instructor has considerable control - his/her own behavior as a teacher.

To this end, the Clinic to Improve University Teaching has designated a number of teaching skills and behaviors as the foci for the analysis and improvement of teaching effectiveness. The first 38 items on the student questionnaire Teaching Analysis by Students (TABS) were designed to provide specific information on each of the 20 teaching skills that form the crux of the Clinic's Teaching Improvement Process. These 20 skills were extracted from a) the results of numerous research studies on instruction, b) inductive studies of effective teaching, c) research in the general area of higher education, and d) the experience of the various members of the Clinic staff.

There is no claim that this list of 20 skills is exhaustive, nor that most of the major instructional skills needed by an effective teacher are represented. In fact, an instructor may perform all these skills with expertise and still fail to provide the best instruction for his/her students.

Instead, these skills are viewed as beginning points in the study and improvement of instruction. The analysis of instructional skills can lead to the examination of such issues as teaching methods, the learning styles of students, curriculum design - departmental and individual, and organizational relationships. For example, an instructor who finds that he has special skills in the area of generating student participation in class may be encouraged to plan and implement a more student-centered curriculum. Likewise, an instructor who discovers particular problems with the pacing and level of challenge in her classes may be encouraged to explore the various learning styles represented among her students and the implications of these styles for the type of instruction that would maximize student learning. In other words, the 20 teaching skills represented in the Clinic's Teaching Improvement Process are not to be viewed as an end in themselves but as a means to the continued exploration and development of various aspects of the instructional environment.

In addition to providing a clear, concise starting point for the analysis and improvement of instruction, the teaching skills approach has several additional advantages over more global approaches. 1) It is flexible. The skills can be combined, omitted, or weighted in different proportions depending on the faculty member and his/her discipline. 2) A strong teaching skills base provides more flexibility for the instructor to meet the needs of changing student populations and to explore a variety of different teaching methods. 3) The twenty skills are applicable to most instructional situations, although some assume more importance in one setting and less in another. The Clinic Process has been utilized with traditional classrooms, laboratories, studios, clinical models, and field work. Programmed, modular, or individually prescribed instructional situations would rely on some of the same skills but since more responsibility is placed on the student in such situations, fewer of the skills would be applicable.

Taken together, the 20 skills covered in the Clinic Process provide a collection of building blocks that can be assembled and reassembled in numerous ways. The nature of the subject matter itself, the entire educational environment, and the expressive style of the teacher determine the importance of specific skills in a given situation rather than any intrinsic value residing in the skills themselves. The aim of the Clinic Process is to assist instructors in recognizing and consciously developing those instructional behaviors most appropriate for themselves and their students.

The 20 skills are described in this manual as discrete, isolatable events. All, however, overlap as to content and applicability and some items from the TABS questionnaire load on more than one skill when factor analyzed (Meredith, 1976). Since the basis of skill analysis is the examination of an entire instructional process, such overlapping is to be expected. Invariably, all of these skills and numerous others are functionally interdependent and the crux of the Clinic's analysis of teaching is to show how a particular strength or problem area has an effect across a whole series of skills.

Finally, a word on the papers contained in this manual. The aim of the following skill definitions is to provide more information on each of the items included in the TABS questionnaire and the corresponding skill titles. The definitions are not meant to be comprehensive statements, but rather overviews of the information available in current literature as well as that extracted from the personal experiences of the Clinic staff as both teachers and teaching improvement consultants. As such, the definitions are meant to serve as a source of reference for further, more extensive exploration. In addition, the definitions will serve to provide a common language for teachers and teaching improvement consultants in their work with the Clinic Process. Although some improvement strategy suggestions are included in many of the definitions, the major purpose of the following pages is not the generation of strategies but rather, the clarification of the components of various instructional behaviors.

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Luann Wilkerson
Clinic to Improve University Teaching
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LEARNING SET
(TABS Items 1-3)

ESTABLISHING A LEARNING SET refers to the instructor's ability to plan and implement specific pre-instructional strategies for the purposes of clarifying, explicating, and arousing interest in subsequent learning experiences and materials (TABS 1-3). In addition, ESTABLISHING A LEARNING SET includes those activities that provide perspective for the task to be accomplished or a framework around which students can organize and remember subsequent learning. In short, by preparing students for dealing with new or unusual situations and knowledge, the instructor is contributing to the establishment of a learning "set" or a predisposition in the student to learn that which is to follow.

In a recent review of research concerning the effect of a variety of pre-instructional strategies on student achievement and attitude, Hartley and Davies (1976) conclude:

> The sequencing and arrangement of subject material appears to influence not only what students learn, but also their attitudes toward the usefulness and importance of what has to be achieved. For this reason, any procedure which makes this arrangement or organization more obvious and striking is likely to facilitate the learning of meaningful material. Nowhere is this more important than in the preliminary phases of teaching and instruction. (p. 239)

In general, pre-instructional strategies are more likely to be successful when the material to be learned is meaningful rather than rote, related rather than unrelated to previous material, and didactic rather than discovery-oriented.

Although research suggests that the instructor is instrumental in influencing the attitude with which students approach learning, both in terms of affecting their desire to engage in learning activities and in terms of influencing the kinds of learning that occur (Aubertine, 1964; Fortune, 1965), many instructors spend very little time preparing students for classroom activities or assignments. Often, this preparation consists of distributing a syllabus, telling students the topic of the upcoming class activity, or asking students to read the next chapter in their text. Rarely is attention given to arousing students' interests in any of these activities or to providing guidelines that help students plan and direct their efforts appropriately.

In most cases, the initial teaching activity of the instructor should be to establish a learning set. Thus, performance of this skill is appropriate at the beginning of a course when the instructor may arouse students' interest in the general topics and activities to be included and may indicate the kinds of learning that are desired. ESTABLISHING A LEARNING SET is also appropriate when introducing a new topic or activity at the beginning of

or during a class session, when the instructor may stimulate interest in exploring a particular area and may provide guidelines to facilitate students' explorations. Finally, performance of this skill is especially important in introducing assignments where successful completion may depend upon the instructor's ability to motivate students and to provide clear directions regarding what is to be accomplished.

Types of Pre-Instructional Strategies

Four types of pre-instructional activities have been found to be effective in increasing the levels of student learning and motivation. Carefully designed and implemented introductory activities--whether conducted at the beginning of a course, a class session, or a unit of study--can provide a learning set for what is to follow, supply a framework for the subsequent learning, and suggest what is essential or important. Although research results do not unequivocably support these positions, the evidence is strong that, depending on the type of material and student involved, various pre-instructional strategies are likely to increase both learning and motivation.

1) Pretests

A pretest is a set of questions given before a unit of instruction and directly related to the knowledge, attitudes, or skills to be learned. The most common purpose of the pretest is to find out what students already know. However, the pretest may also serve to alert students to the material that is to be covered while providing them with a framework for organizing, remembering, and evaluating the material as it is covered. Pretests are particularly effective in increasing student achievement when the material to be covered is loosely structured, when students are somewhat familiar with the topical area, and when knowledge of results is provided after the testing (Hartley & Davies, 1977).

2) Learning Objectives

The clarification of learning objectives for students has been found to favor student achievement and to promote teaching effectiveness (Belgard, Rosenshine, & Gage, 1971; McNeil, 1967; Popham, 1966). Learning objectives are statements of the intended outcomes of instruction in terms of desired student behaviors, e.g., "as a result of this unit of instruction, the student will be able to . . ." (Mager, 1962; Tyler, 1950).

Students have a better sense of how they should approach and participate in upcoming activities if the instructor informs them BEFOREHAND about the content to be learned, the skills to be mastered, or the attitudes to be examined. For example, an instructor might give a lecture on the study of the Samoan culture. If students are to listen to the lecture in order to acquire knowledge about the culture, they will focus upon the characteristics and facts reported about the culture. On the other hand, if students are asked to learn how different cultures are studied, they will focus upon the procedures and methodologies of

investigation rather than upon specific facts and findings. The instructor might help students direct their attention toward the desired learning by making a brief introductory statement:

> As we talk about this culture, think about how researchers have gone about studying the Samoans. While I think you'll find the Samoans an interesting people, I'm not so concerned that you remember the facts and characteristics of their culture. It's more important that you know <u>how</u> the culture was studied--what methodology and procedures were used.

One common characteristic of all learning objectives is the inclusion of an action verb describing some activity to be undertaken by students. Bloom's Taxonomy of Educational Objectives (1956) is particularly useful in clarifying the level of learning desired. Progressing from simple to more complex cognitive functions, Bloom lists six types of learning: knowledge or mrmory, comprehension, application, analysis, synthesis, and evaluation. Objectives for a particular lesson may include behaviors at one or more of these levels. (See attached suggestions.)

The specification of learning objectives has been found to be most effective in traditional lecture or discussion situations in which the material is loosely structured and dynamic in nature. Middle ability, more independent, and less conscientious types of students have been found to benefit more than others from the structure and perspective provided by learning objectives.

3) <u>Overviews</u>

An overview or summary of what is to be accomplished in an entire course or a particular unit may be used to emphasize salient points in the content by condensing, cimplifying, and repeating key ideas in a brief, precise manner. Overviews may take the form of:

--a preview of topics to be covered;
--an outline of a lecture or film;
--a list of procedural steps required to accomplish a task;
--a worksheet that focuses students' attention on important sections of assigned readings;
--key questions to provoke student interest and/or encourage discussion
--a list of technical terms to be covered.

In summary, the overview introduces new material by explicating central arguments, key concepts, principles, or terms while indicating the broad scope of the material.

Little research has been conducted on the effect of overviews on student achievement, although Rosenshine and Furst (1971) listed the use of structuring comments as one of 9 variables found to influence student achievement across numerous studies. Some evidence does suggest that overviews are more useful for factual as opposed to conceptual learning and for lower, rather than higher ability students.

4) Advance Organizers

An advance organizer is any pre-instructional strategy that serves to link new and unfamiliar material to that knowledge or experience already possessed by the student. Any number of advance organizational strategies may prove successful in increasing student motivation and learning by emphasizing a familiar context for new learning:

Arousing controversy

Instructors may stimulate students to investigate a topic by introducing it as a controversial issue. This may be accomplished by taking an extreme position on the issue, by presenting conflicting viewpoints, or by asking students to share their positions regarding controversial topics.

Using surprise tactics

Sometimes students' interest may be aroused if they discover that things they have taken fro granted turn out to be less obvious or certain than they had thought, or if they discover that what initially appears to be true, turns out to be false. For example, an instructor might present an incomplete report leading to an inaccurate interpretation of some event. Then, s/he might present additional information that will cause students to question their initial interpretation of the event. Thus, the need to gather more information is demonstrated and students may be stimulated to investigate the topic more thoroughly.

Using analogy

Students are more likely to pursue instructional goals if they perceive those goals to be related to their current interests. The use of analogy is one way of establishing this relationship. The instructor begins by asking students to consider some object, person, event, or condition that is known and of interest to them. This initial subject then becomes a reference point to which the new material or activity is compared. If carefully chosen, the analogy created serves as a vehicle for transfering students' interest to the new activity or material.

Using simulation

When used creatively and appropriately, simulations are powerful strategies for arousing students' interest and maintaining students' involvement. The instructor attempts to create a context or environment in which students may directly experience conditions similar to those that are to be studied. The instructor might use any one of a number of simulation "games" which have been developed for various disciplines, or such simulations may be created by the instructor to fit a specific area of study (Fransecky & Trojanski, 1972).

Using media

Students may be motivated to participate in classroom activities through the use of various media events. A film, videotape, slide, or recording series may be used to set the stage for a new topic or activity. Media events serve to capture and refocus students' attention on the task at hand. Such activities may also serve as demonstrations of the material

to be learned or suggest situations in which the new learning might be useful or applicable.

Using problem solving

In order to demonstrate the relevancy of material to be learned, the instructor may use problem solving to set a context for new learning. Individual, small group, or class discussions of possible solutions to a given problem may serve to clarify various components of the material to be covered. In addition, the teacher is able, by considering proferred solutions, to determine the extent and nature of existing student knowledge in the area.

Advance organizers are most effective when used in those instructional situations requiring some sort of conceptual framework for the task ahead or when the subject matter can be integrated with existing knowledge or experience. In addition, Ausbel & Fitzgerald suggest that students of lower ability profit more than others from this approach to course or class introductions.

Summary

Because the "set" with which students approach instructional activities largely determines the time and energies students will invest in these activities and the kinds of learning that will occur, the behaviors related to ESTABLISHING A LEARNING SET are among the most important teaching activities an instructor performs. Since students' interests and abilities are so diverse, effective performance of this skill is a demanding task, requiring judgment in selecting appropriate strategies, flexibility in using a variety of techniques, and creativity in adapting and applying techniques to a variety of situations.

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TAXONOMY OF EDUCATIONAL OBJECTIVES IN THE COGNITIVE DOMAIN

from Bloom, B. S.; Engelhart, M. B.; Furst, E. J.; Hills, W. H.; & Krathwohl, D. R. Taxonomy of Educational Objectives. New York: Longmans Green, 1956.

Classification	Examples of Action Verbs
KNOWLEDGE. Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.	define, identify, recall, recognize, acquire, dinstinguish, repeat, record, list, name
COMPREHENSION. Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.	describe, recognize, identify, locate, translate, illustrate, rephrase, restate, explain, estimate, review, differentiate, determine
APPLICATION. Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.	interpret, employ, operate, demonstrate, practice, illustrate, apply, generalize, choose, use, transfer, restructure, relate, schedule, sketch
ANALYSIS. Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.	distinguish, detect, classify, contrast, compare, deduce, analyze, differentiate, appraise, calculate, test, diagram, debate, relate, solve, categorize

SYNTHESIS. Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with a major emphasis on the formulation of new patterns or structures.	compose, construct, arrange, collect, create, prepare, originate, document, produce, plan, propose, design, modify, manage, develop, combine, organize, formulate
EVALUATION. Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in the area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.	judge, argue, validate, assess, decide, support, compare, contrast, appraise, evaluate, rate, value, revise, select, estimate, measure

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LOGICAL ORGANIZATION
(TABS Items 5, 6, and 7)

LOGICAL ORGANIZATION refers to the instructor's skills in arranging and presenting course material and learning activities so that the relationships among the various topics and activities are clear. Teaching that helps students find a framework within which to fit new phenomena is likely to be much more effective than teaching that simply communicates masses of material in which the student sees no organization. The research reviewed by Rosenshine (1971) presented a number of studies where the variable of teacher organization was found to be positively correlated with student achievement. In a more recent study of student ratings and their relationship to student learning, Centra (1976) found that ratings of course objectives and organization were fairly well correlated with achievement. Moreover, Hildebrand, Wilson and Dienst (1971) found that behavioral descriptions corresponding to organization discriminated between "best" and "worst" teachers when university students were asked to rate their instructors. If an instructor is skilled in integrating material and activities into an organizational framework and is able to help students perceive the logical organization of that framework, it is likely that there will be an increase in student achievement and that students will develop a more positive attitude about the class and the competency of the teachers.

Deciding upon an Organizational Framework

The first step in organizing a course is the working out of objectives and the selection of course materials and activities to accomplish those objectives. The determination of objectives and decisions about course content are often subjective, but should be guided by considerations of what people knowledgeable in the field regard as necessary or desirable. Although the results of research into the effects of communicating objectives to students is inconclusive (DuChastel & Merrill, 1973), the clarification of learning objectives for the faculty member him/herself has been found to favor student achievement and to promote teaching effectiveness.

Once materials and activities have been selected, the instructor's task is to decide upon a framework within which various phenomena to be considered in the course may be organized. This not only requires decisions about which concepts, topics and activities are to be emphasized, but also decisions about how to sequence the materials to be covered and the activities in which students will engage. Such decisions are made partly on the basis of the organization that the instructor and others knowledgeable in the field have found useful for integrating and understanding the material, and partly on the basis of situational variables, such as length of time, departmental emphases, etc.

Helping Students Understand the Organizational Framework

Effective LOGICAL ORGANIZATION not only requires that an instructor decide upon a structural framework within which materials and activities are

interdependent and coordinated, but also that the instructor clarify the organization of the relationships among various materials and activities in the course. In a study of five approaches to the communication of course organization to students, Cheony (Gage & Berliner, 1975) found that initially or progressively revealing the interrelationships among various components of course material produced higher student achievement on both essay and objective examinations than did those conditions in which no communication of organizational principles was made by the instructor.

1) Initial Structuring Behaviors
Beginning a course or unit or lesson by establishing a framework for the material to be covered may facilitate student understanding of the LOGICAL ORGANIZATION of subject matter. Explicit statements of aims and objectives inform students of exactly what they are expected to take away from a lesson or series of lessons. As such, they serve as advance organizers around which students may integrate the subsequent material and activities. Moreover, providing a frame of reference in which previous materials and activities are reviewed and future directions are previewed allows students to place content and activities within a structural context. In this way, the relationships among specific objectives and activities and broader content issues are made clearer to students. (see ESTABLISHING A LEARNING SET for other examples of structuring behaviors.)

2) Progressive Structuring Behaviors
Even when the instructor has provided advance organizers and has established a frame of reference at the beginning of a unit of instruction, students may still lose track of the organization of the subject matter. One reason for this may be that, while the distinctions between major and minor topics in a subject may be clear to an expert, the various levels of importance are not always so apparent to a learner just beginning to explore the subject. A crucial element in improving student achievement seems to be the use of transitional statements designed to highlight or emphasize the relationships among various units of material (Thompson, 1960). Lectures rated as highly effective more frequently than others were found by Rosenshine (1971) to include more rule-example-rule sequences of explanation and prepositions or conjunctions to indicate relationships within the material.

By emphasizing important aspects of the subject matter and activities, the instructor helps students to identify the more important topics and concepts and understand their relationships to material which is important only in that it supports, illustrates, or clarifies these central ideas. The instructor may provide emphasis by raising his/her voice, gesturing, pausing to let important ideas "sink in," etc. Or he/she may use verbal markers of importance--explicit statements which identify important topics or ideas. These might include listing key ideas on the board, making statements such as "now, this is really important," or "this is an example of . . .," or "this is an interesting digression."

The presence of verbal markers of importance was found to be higher in classes where students performed higher on achievement tests (Pinney, 1969; Petrie, 1963). Finally, the instructor may emphasize the more important aspects of a topic by asking students to make decisions about the importance of particular materials, ideas or activities. Whatever techniques the instructor chooses, providing emphasis helps students identify important topics and organize less important information around them.

Increasing the Goal Directed Behaviors of Learners

Another reason that students sometimes lose track of the LOGICAL ORGANIZATION of the subject is that they lose sight of the connections between learning activities and materials and course or class objectives. Not keeping these relationships clearly in mind, their attention and activities are not always goal-directed, or may not be perceived as being goal directed even when they are. The instructor may help students see the relationships between activities in which they are engaged and the objectives by performing various task orientation behaviors--reminding students of the objectives, pointing out times when discussions or activities seem to be "off the subject," and redirecting students toward meeting defined goals. The instructor also helps students remain aware of LOGICAL ORGANIZATION by reinforcing goal-directed behavior when it occurs--commenting when students are "on the right track," when they've raised important issues, when they've accomplished the objectives efficiently and thoroughly, etc. Task-oriented behavior need not be rigid adherence to a lesson plan or curriculum, nor should it prevent "spur of the moment" changes in directions or plans. Moreover, effective LOGICAL ORGANIZATION does not require that an instructor always be task oriented. But well-timed task orientation behaviors insure that, over the long haul, classroom activities are aimed at clearly defined objectives and that students see the relationships between the two.

In a broader sense, the instructor may help students understand the LOGICAL ORGANIZATION of the course by expanding their perspective. Relating specific materials and activities to their implications, to other aspects of the curricula, to other viewpoints, and to outside-of-class experiences provides for students the widest possible associative net within which a variety of life experiences can be organized.

Finally, an instructor may facilitate students' understanding of LOGICAL ORGANIZATION by providing signals of transition during a lesson and by tying things together at the end of an instructional unit. Transitions which signal the end of one segment and the beginning of another provide students with reference points so that they know where the lesson or unit is, in light of where it's going. Closure at the end of a lesson or a unit or a course enable students to perceive and integrate the major concepts and relationships.

The Clinic to Improve University Teaching does not advocate that instructors develop rigid organizational systems or tightly organized lesson plans. Often a particular structural framework helps one person understand various phenomena, but does not facilitate integration and

coordination of that phenomena for others. Moreover, a worthwhile educational goal may be to help students acquire the skills of LOGICAL ORGANIZATION. It is the intention of the Clinic to identify teaching behaviors which help students find a framework within which to fit a variety of materials and experiences.

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PACING
(TABS Item 8)

PACING refers to the rate at which new ideas and activities are introduced or to the amount of time spent on a particular topic or task. Effective teaching is not so much the frequency or infrequency with which specific instructional skills are utilized but rather the combinations, sequences, rhythms, and paces of what the teacher does (and hence, the students do). PACING, therefore, involves the synthesis of numerous teaching skills into a meaningful whole that is most appropriate for a particular group of students.

Planning the Course

Decisions about PACING during the planning stages of a course are based partly on the instructor's judgments about the timing and weighting of various topics and activities. The instructor's decisions about when topics or activities are to be introduced should be consistent with the logical organization of the subject matter. Decisions about the amount of time spent on particular topics or activities should reflect the instructor's judgments about the relative importance of the objectives toward which those topics or activities are directed. For example, it is unreasonable to allot two weeks to developing a relatively minor point or to plan lengthy assignments or activities around less important objectives.

The instructor's "best guess" about how much students will be able to understand and accomplish within a given amount of time should also influence decisions about PACING during the planning stages. The more information available about students' backgrounds, abilities, and interests, the better the instructor's guesses about PACING will be. Feedback on instructional effectiveness obtained in previous semesters is a valuable resource in planning for the appropriate amount of material to be included in a particular course.

Effective performance of this skill requires that an instructor be able to change the PACING of instruction if and when it is inappropriate. Flexibility in a teacher's attitude and approach to teaching is extremely crucial. It's often painful to "throw out" material or activities into which much planning time and energy have been invested, even when student responses clearly suggest such abandonment. And it's difficult to allot additional time for instruction on particular subject matter or to sacrifice some objectives when there is pressure "to cover a certain amount of ground."

Maintaining an Appropriate Pace

Unfortunately, decisions about PACING made during planning sometimes turn out to be inappropriate as instruction proceeds. One of the most frustrating experiences for teachers is the discovery that carefully planned schedules must be discarded because the students who enrolled turn out to be different from the students that the instructor had in mind while planning the

schedule. It may turn out that students are able to understand difficult information or accomplish complex tasks more quickly than anticipated. By speeding up the pacing of instruction, the instructor can avoid "losing" students who will become bored if too much time is spent on such information or activities. On the other hand, the instructor may discover that students are having difficulty with concepts or tasks that they were expected to master easily and quickly. As it is not a good idea to introduce new information or activities before students have mastered previous subject matter, additional elaboration and practice may be required before students are able to integrate the material, complete the activities, and move on to new things. If the instructor sticks to a schedule that is clearly inappropriate for students or that the teacher does not know is inappropriate for students in the class, students are likely to become confused, bored, or frustrated.

Effective teaching requires that the instructor be able to assess student responses to instructional pacing. The degree of learning a student will exhibit is a function of the time allowed for learning and the time needed by a particular student to accomplish that learning (Carroll, 1963). Degree of learning = f $\frac{\text{Time allowed for learning}}{\text{Time needed for learning}}$. Inflexible adherence to a course syllabus can increase the difference between these two variables and, thereby, lower the degree of learning. The quality of the instruction, the motivation of the student, and the student's ability to understand the instruction all enter into the PACING decision as well. The complete model is:

$$\text{Degree of learning} = f \frac{\text{Time allowed for learning} \times \text{motivation}}{\text{Time needed to learn} \times \text{quality of instruction} \times \text{ability to understand instruction}}$$

Although the instructor cannot hope in a classroom situation to maximize the degree of learning for every student, s/he can make adjustments that will increase the probability of student learning:

a. Although the instructor must be careful about interpreting nonverbal behaviors, such cues as poor student attention, signs of boredom, or expressions of frustration or confusion may suggest that the pacing is inappropriate.
b. Generally poor marks on homework assignments, quizzes, and examinations may indicate that pacing is too fast.
c. Unfortunately, the time lag between instruction on particular subject matter and evaluation of student learning may not enable the instructor to adjust the pacing when that adjustment would be most beneficial. An instructor may obtain more immediate feedback about pacing by frequently and systematically asking questions to check for student comprehension. Imprecise answers to such questions may suggest the need for more elaboration; uninspired responses may indicate the need for a change in topic or activity. Questions might take the form of a non-graded quiz, a question and answer sequence, or small group problem solving.
d. An often informative and useful strategy is to ask students directly about PACING: "Am I moving too fast?"; "Are you with me so far?"; "Shall I give another example?"; "Should we work another problem?"

e. At the end of a class session, the instructor might give students several minutes to write down questions about a particular issue. S/he might then plan the subsequent session with such questions in mind.

In general, adjusting the PACING of instruction to suit learners requires the ability to "think on one's feet." The instructor must be able to provide additional examples or problems on the spot. The instructor must be able to make immediate decisions about changes in assignments or activities or schedules, and be able to come up with alternatives. Such demands require creativity as well as flexibility.

PACING, then, is something that ought to be planned for as a teacher thinks about the content and objectives of a course and considers the probable characteristics of the students who will enroll. Even with such planning, however, variations and adjustments are likely to be necessary as courses and classes proceed. These adaptations will be facilitated where active attempts are made to solicit and interpret student reactions.

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ELABORATION
(TABS Item 9)

The skill of ELABORATION pertains to the instructor's skill in clarifying or developing an idea or topic. By elaborating or expanding upon a new topic, concept, or idea, an instructor enables students to more fully comprehend or grasp the meaning of new subject matter. Elaboration may take the form of illustrative examples to reinforce a point; supporting documentation to verify a principle; analogies to which students can relate; comparisons with knowledge students already possess; or the development of cause-and-effect relationships among ideas. Whatever method utilized, it is through elaboration that an instructor develops in a more structured way new topics, concepts, or ideas.

Effective performance of the skill of ELABORATION involves the instructor in the making of three decisions:

a. how should the material be initially organized?
b. how much elaboration is required by a particular student(s)?
c. what method(s) of elaboration is most appropriate?

Logical Organization

Elaboration initially involves the instructor in determining the most appropriate organizational scheme for the subject material. Gover (1966) developed the following four ways that ideas may be organized to increase the comprehension of new material: a) part-whole organization; 2) sequential organization; 3) material-to-purpose organization; and 4) transitional organization.

1) Part-whole Organization
In the part-whole organization, facts, concepts, or ideas (parts), are grouped by the instructor under common, unifying headings (whole). Such organization allows students to grasp the overall picture as well as those components which contribute to it. Instructors should be careful to make explicit what the headings are and precisely what individual concepts should be included under each one.

2) Sequential Organization
In the sequential organization of ideas, facts, concepts, or ideas are ordered by chronology, importance, etc. Ideas may also be arranged in ascending order of difficulty thereby enabling students to master simple ideas before moving on to those that are more complex. Making known the reason for the selected sequence to students will aid them in their comprehension and retention of the material included.

3) Material-to-purpose Organization
An instructor, in the material-to-purpose organization of ideas, determines a central theme (purpose) within the subject matter and then elaborates upon only those ideas (materials) that are consistent with that theme. S/he excludes those fringe, tangential, or inconsequential ideas which only serve to confound students and focuses exclusively on those ideas that are supportive of the main theme.

4) Transitional Organization

Transitional organization makes use of key transitional phrases or words to indicate to students what the important elements of the subject matter are. Such phrases serve to distinguish between major and minor points. For example, phrases like "another important aspect is" or "a third significant determinant is" help students to focus on the important points of an explanation.

It has been suggested by Rosenshine (1971) that "explaining links"--key prepositions and conjunctions--also serve as cues for students as to the relationships that exist among various ideas within a topic. For example, words and phrases such as "because," "therefore," "as a result of," or "in order to" reveal the connections that exist between ideas, causes and effects, correlations, etc.

Various other organizational schemes are suggested by Hart (1973) in TABLE 1 as particularly appropriate in the lecture situation. ELABORATION is not restricted to lecturing but may follow discussion, role-playing, simulation or other student activity sessions in order to clarify the major points discovered or discussed. ELABORATION may also be required as a result of questions posed by students (see RESPONDING TO QUESTIONS.) In fact, ELABORATION may, on occasion, be provided by students through the use of probing questions (see ASKING QUESTIONS) or student presentations (see STUDENT PARTICIPATION).

Amount of Elaboration

The amount of elaboration required for a particular topic is largely situational. In order to determine when elaboration is required by a student or group of students, the instructor will need to conduct checks for student comprehension. The skill definition for LEVEL OF CHALLENGE details several techniques for the quick assessment of student comprehension. These include the use of:

a. periodic instructor-generated questions;
b. frequent opportunities for student-generated questions;
c. strategies for peer interactive feedback;
d. no-fault quizzes; and
e. non-verbal cue recognition.

Methods of Elaboration

1) Comparison

The instructor may clarify a particular idea by comparing it to a set criteria or standard that is familiar to students. Comparisons may also be made between or among ideas to clarify relationships and expand upon common qualities within a specific class.

2) Relevant Terminology

Choosing vocabulary, examples, or illustrations with which students are familiar helps to support the clarification of ideas. This is not to say that explanations should necessarily be simplistic, but rather, that

TABLE 1

Specific Organizational Approaches to Lectures
(from Hart, 1973)

Type	Description
Chronological	Emphasizes the time sequence of lecture topics. Maintains a narrative line.
Spatial	Shows coherence or differentiation among lecture topics in terms of space relationships.
Causal	Attempts to show the clear, sufficient and/or practical limitations or cause-to-effect or effect-to cause relationships.
Ascending-Descending	Places lecture topics in sequence according to their importance, familiarity, or complexity.
Problem-Solution	A standard pattern of organizing lecture topics by means of dramatizing an obstacle and then presenting alternative remedies.
Topical	Perhaps the most common method of organization whereby selected but parallel elements of the same subject are focused on successively.

they should be from a vocabulary or body of knowledge that can be easily recognized by students. By using words or examples that confuse or confound students, the instructor runs the risk of impairing student comprehension.

3) Visual Aids
Charts, graphs, and overhead projections are among those visual aids that can be used to effectively enhance an explanation. Besides providing an additional stimulus in the classroom, they are convenient and efficient ways to present new material. Instructional aids such as these may need to be accompanied by additional oral clarification by the instructor.

4) Extended Example
The instructor can develop an analogy to explain the details of a particular event, skill, or piece of information. Analogies of an unexpected nature may provoke increased student attention to and retention of material to be learned (Davis, 1976).

5) Quantification
By explaining the various steps in a given topic, the instructor can elaborate by adding detail. The use of verbal markers such as "number one . . . number two . . . number three . . ." serve to clarify the relationship of the detail to the whole.

6) Isolated Comparisons
To add realism to new information, the instructor may relate new information to previous experiences shared by members of his/her audiences, e.g., "It's like your first date." In addition, the instructor may return to the initial comparison to provide reference points for the recall of information, e.g., "You remember, it was like that first date."

7) Testimony
Quotations from known or respected sources can be used to support new information. Depreciatory quotes from sources of ill-regard can also be useful in the clarification of communication.

8) Contrast
By depicting opposing elements, the instructor can clarify the unique components of new information.

Summary

As can be seen, an instructor may take advantage of a wide variety of techniques to elaborate, clarify, or develop new ideas. Instructors will need to plan effective ways to organize new subject matter, to check for student comprehension, and to provide appropriate clarification. Since most instructors spend the majority of class time presenting and explaining new material, it is important that they effectively use the skill of elaboration.

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EXPRESSION
(TABS Item 10)

> A healthy emotional atmosphere . . . depends above all on clear and unambivalent communication, which is not be to confused with information. . . . Communication connotes much more than the explicit transmission of verbal messages. Communication includes all those processes by which people influence one another. It includes both verbal and non-verbal messages. It is the sum total of transmitted feelings, attitudes and wishes. It conveys literal content and is also a comment on the relationships among the people involved. (Loewenberg, 1972, p. 7)

EXPRESSION refers to the instructor's skills in using both verbal and non-verbal behaviors to increase the power and meaning of his/her communication. "Effective speakers convey a desire to communicate, a sense of audience contact, and a spontaneity, all contributing to a conversational quality." (Verderber, 1970, p. 70). The speaker may increase his/her expressiveness through the use of humor, movement, enthusiasm, voice modulation, diction, enunciation, and gesture. Although the best delivery will not make up for a poorly prepared presentation, a poor delivery will obscure exceptional content and organization.

Two studies conducted by Ware and Williams (1975, 1976) have produced conflicting evidence on the effect of expressiveness on student achievement. In general, the authors conclude that where external incentives for learning are low--as in a required course--expressiveness can play an essential part in maintaining student attention. On the other hand, these same authors warn against the "Dr. Fox" effect: high expressiveness can increase student ratings of instruction without reflecting an increase in the amount of content covered or the level of student achievement.

Characteristics of Effective Communication

1) Effective speakers demonstrate a desire to communicate. Persons who are naturally less demonstrative will find it more difficult than others to communicate concern for the audience or the topic. Whereas the extrovert is highly expressive even when his/her feelings are not very strong, the less expressive person may find it necessary to intensify his/her expressive style in order for that emotion to be conveyed to the audience.

2) Effective communication demands direct contact between the speaker and the audience. For the classroom instructor, inappropriate use of the board, the overhead, or lecture notes is the most frequent block to the maintenance of direct contact with students. As a speaker, one has a certain amount of control over the audience's attention simply by looking at them. In addition, the maintenance of good eye contact can increase audience confidence in the speaker while providing a valuable source of immediate feedback. Puzzled looks, yawns, shifting

body positions, tentatively raised hands can provide the instructor with continual information on the quality of the communication being achieved.

3) Effective communication gives the impression that the ideas expressed have a fresh, new, and vital quality for the speaker. However, this does not suggest that presentations should be unplanned or given without notes. Rather, it suggests that content be presented using one's own conversational style.

4) Effective communication demands voice control in order to produce variety, expressiveness, and intelligibility. Through clear articulation and the variation of pitch, rate, and sentence pattern, the speaker can give more precise meaning to his/her words. Such variations can also be used to emphasize major points, to clarify the organizational structure of a lecture, or to maintain students' interest.

5) Effective communication uses nonverbal behaviors to increase the vitality of the presentation. By supplementing his/her words with appropriate movements of the face, arms, hands, and body, the speaker can increase the attention of the audience to the lecture and its content. However, facial expression, gestures and bodily movement should be linked to the meaning of the communication. Ideally, movement is used to emphasize an idea, call attention to a particular point, or reactivate audience attention.

In summary, effective expression communicates the involvement of the instructor with the topic and the audience. It is direct, spontaneous, vital, and intelligible.

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ASKING QUESTIONS
(TABS Items 11 and 12)

ASKING QUESTIONS refers to the instructor's ability to use different types of questions for a variety of instructional purposes. The average frequency of teachers' oral questions has been estimated in various studies to be quite high (Gall, 1970). However, evidence suggests that quality, not quantity, of questions is the essential factor in increasing student behavior at more complex cognitive levels (Dunkin & Biddle, 1974; Rosenshine, 1971). With findings indicating that 80 percent of teacher questions ask for the recall of knowledge previously heard or read (Gall, 1970), it appears that many instructors need to expand their skills at asking more thought-provoking, critical questions.

Typically, it's the case that instructors ask questions without any clear sense of purpose or direction. The result is that questions are not the powerful aid to effective teaching and learning that they might be. The remainder of this explication will look briefly at the purposes of questioning, the types of questions, the characteristics of good questions, and some suggested techniques for using questions.

Purposes of Questioning

Questions may serve a number of purposes across various instructional approaches. They may be used to arouse students' interest in a topic or activity, to check for students' understanding, to increase student participation, to provide an opportunity for students to apply, analyze, or evaluate newly acquired knowledge or skills, or to direct students' attention to significant elements within a presentation. For whatever purpose they are to be used, effective questions should be carefully planned in advance. The intent, content, and timing of questions should be formulated in advance, although the exact wording of questions might evolve during the class session itself.

1) To Arouse Curiosity and Motivate Inquiry
   Questions may be used to obtain and maintain the interest of the learner. A few stimulating questions at the beginning of class can not only arouse students' interest, but can also let the students know what material they will be covering. By posing a few quick questions, an instructor can challenge students to deal with unfamiliar material or puzzle them so that they will seek the answer during the class.

   Stimulating questions can be used during the class period to focus or refocus the attention of students. Such questions, properly placed in a presentation, provide a new set of stimuli which can be a source of renewed interest to students. Instructors can use nonverbal student feedback to inform them of waning student interest and utilize questions to recapture student attention.

2) To Check on Student Comprehension
This type of question checks for recall of specific facts, concepts, and principals. Too often this is the only type of question an insructor uses. However, in perspective, these questions have several important purposes.

a. Strengthen Comprehension
One purpose is to strengthen comprehension through practice. Like a muscle, the brain needs to be exercised to develop itself and a certain amount of drill is effective in learning. While most college professors consider this type of questioning remedial, it does let students know very quickly what they do or do not know.

b. Provide Feedback to the Instructor
Second, checking on student comprehension is an excellent source of feedback for the instructor. The instructor immediately knows how well s/he has taught or how well the students have done their homework.

c. Establish a Cognitive Groundwork
Finally, higher order thinking can be done only if the basic facts, concepts, and principles are learned and learned well. The effective instructor uses questions to check for student comprehension before moving on to higher cognitive levels.

3) To Vary the Cognitive Level at Which the Subject Matter is Presented
Many instructors have as a goal of their courses teaching students to "think." What they mean, generally, is for students to learn more than facts. They want students to know how to interpret, apply, use, evaluate, etc., these facts in order to process information at increasingly complex cognitive levels. Questioning strategies can be used to facilitate this goal.

4) To Develop Rapport and Increase Student Participation
Learning comes in many ways, one of which is sharing personal perspectives, feelings, attitudes, and anecdotes. Today most students have had experiences that could have an important bearing upon the understanding of a given lesson. The instructor can use questions to draw upon this valuable reservoir to supplement and interpret data already before the class. This utilization of student experience or prior knowledge can assist in the development of class rapport while increasing student participation.

5) To Direct Attention to or Focus Upon Significant Elements in the Lesson
Within every presentation, homework assignment, or activity some points are more important than others. These are points that students should definitely retain. Establishing focus and directing attention through questioning can be a useful technique in increasing retention. Through such questions, students can discover the important elements of a lesson as well as develop an understanding of the instructor's values and methods of critical thinking. Such questioning also gives students an indication of what they should concentrate on for examinations.

Types of Questions

Recently, considerable attention has been given to the classification of the types of questions used in classrooms. These efforts have resulted in several classification schemes: convergent/divergent questions; higher order/lower order questions; open/closed questions; taxonomies of questions suggested by Bloom's Taxonomy of Educational Objectives (see attached listing). These classifications are based largely on the cognitive functions of questions. That is, different types of questions "lead" students to process information at particular intellectual levels.

Since the classification systems based upon Bloom's taxonomy of objectives provide a useful tool for discrimination among types of questions, a brief description of such a system may suggest strategies for constructing and using questions directed at achieving various cognitive objectives. The classification outlined below is described in greater detail in Classroom Questions (Sanders, 1966). Briefly, however, Sanders classifies questions into the following categories:

1) Memory

Memory questions require the student to recognize or recall information. The greatest problem in this category is not how to construct good memory questions, but rather how to determine the knowledge that is to be remembered. The proper boundaries of this knowledge are subject to disagreement, but generally, memory questions should be used to help students focus on that knowledge that will provide a foundation for the higher cognitive levels.

Example

The taxonomy of questions deals mainly with which of the following?

a. cognitive learning
b. affective learning
c. physical learning
d. none of the above

2) Translation

Translation questions ask students to change information into a different symbolic form or language. An idea can be expressed in several different forms of communications: pictures, graphs, charts, maps, models, statements in technical language, statements in layman's language, etc. Translation thinking is quite literal and does not require students to discover intricate relationships, implications, or subtle meanings. The student identifies one part of the original communication at a time and translates it into the new form.

Example

Suppose that an observer classified each of the questions asked by an instructor during a class period and found the following frequencies:

Memory -- 10	Interpretation -- 2	Analysis -- 0
Translation -- 6	Application -- 1	Synthesis -- 0
		Evaluation -- 1

Construct a bar graph to present this information to the instructor. (Assume the person answering this question knows how to construct a bar graph.)

3) Interpretation

Interpretation questions ask students to discover relationships among stated facts, generalizations, definitions, values and skills. Interpretation questions are explicit about what the student should do. The generalizations, criteria for comparison, statistical information, etc. to be used in discovering the relationships are identified in the questions. The student does not need to make decisions about the bases for establishing the relationships.

Examples

Assuming that the type of questions asked in classrooms directs the kinds of thinking that students do, at what cognitive level would you guess most students were operating in the classroom for which you drew the histogram?

Classify each question that you ask during a lesson according to Sanders' Taxonomy of Questions.

4) Application

Application questions ask students to solve problems that require identification of the issues and the selection and use of appropriate generalizations and skills. Application questions are designed to give students practice in new skills and in independent use of knowledge and skills. Application questions present problems that approximate the form and context in which they would be encountered in life. The learner is required to furnish all necessary generalizations, criteria, classifications, etc.

Example

How would you design a class session that would get students to think about the day's subject matter in increasingly complex ways?

5) Analysis

Analysis questions require solutions to problems in light of conscious knowledge of the parts and processes of reasoning. The distinctions between Analysis questions and Application and Interpretation questions are easily blurred since the latter two cannot be answered without some elementary knowledge of logical reasoning. However, Interpretation and Application questions require "common-sense reasoning," whereas Analysis questions require the student to be conscious of the intellectual process s/he is performing and to be able to explain the rules for reaching a valid and true conclusion.

Example

The Clinic to Improve University Teaching believes ASKING QUESTIONS is an important teaching skill. Analyze the reasoning behind this conclusion.

6) Synthesis

Synthesis questions encourage students to engage in imaginative, original thinking. Unlike the earlier categories of questions in which the course of thought starts with a problem and converges to one correct answer, Synthesis questions begin with a problem that offers a variety of possibilities radiating out to many satisfactory answers. Questions that ask students to create an original story, poem, etc., are not the only Synthesis questions; students may also be required to engage in imaginative, original thought if asked to formulate hypotheses, plan courses of action, design experiments, etc.

Examples

Design your own system for classifying classroom questions.
Design an instructional training program for teaching assistants in your department.

7) Evaluation

Evaluation questions ask a student to make a judgment according to some standards s/he designates. They require students to perform two steps: 1) to set up appropriate standards or values; and 2) to determine how closely the idea or object meets these standards or values. Evaluation questions require that students have an understanding of the differences between values, facts, and opinions.

Examples

Which category of questions do you think is most important?
Should a training program for teaching assistants include training in asking questions?

Instructors or observers who attempt to classify questions actually used in classrooms may find it difficult to assign a particular question to one category, since the level of thinking required by a given question often depends upon the context in which it is asked and the responses that it elicits. For these reasons, the taxonomy should not be viewed as a rigid classification scheme into which each and every question must be categorized. It is probably most useful as a guide for instructors to use in planning for a varied intellectual classroom experience and as a rough tool for checking the intellectual level at which most of the questions asked in a given class are directed.

Planning Good Questions

1) Questions Should Reflect a Definite Purpose

To both the student and instructor, questions should reveal a direct relationship with the objectives of the course or lesson. Questions without a purpose do not facilitate learning.

2) Questions Should be Stated Concisely

Auditory memory span is short. Long drawn out questions will not be remembered. Unless an instructor plans to write out the questions, they should be kept short and concise.

3) Questions Should Require Thoughtful Responses
"Yes" or "No" responses do not usually elicit much thinking from students. Unless drill is an instructor's purpose, extended and thoughtful responses are the most desirable. Questions requiring thought strengthen problem solving skills and focus students to think at higher cognitive levels.

4) Questions Should Not be Ambiguous
Stating exactly what is intended is not always easy. The impact of a question is quickly lost if it is capable of several interpretations. Stating questions simply, clearly, and concisely will aid the student and enhance discussion. A specific question will consistently elicit more student responses than a general question, such as "Are there any questions?" or "Does everyone understand?" (Dauterman, 1970).

Techniques for Asking Questions

There are no hard and fast rules for asking questions. However, here are a variety of techniques that some educators have found to be effective (Gall, 1970).

1) Address Questions to the Class Before Designating a Specific Person to Respond
This technique has several advantages. First of all, it secures the general attention of the class. Secondly, all members of the class have an opportunity to formulate a tentative answer. Finally, attention is focused on a specific point. However, the instructor may then wish to call on specific students by name or to pose the question to the inattentive in order to bring them into the mainstream of the discussion.

2) Allow Sufficient Time for Formulation of Answers
Most instructors get very uncomfortable when there is a long pause after a question is asked. The instructor should not overlook the fact that while he has a tentative answer in mind before asking the question, the student must pause to redefine the question for himself; recall, analyze, or evaluate certain knowledge; and then clothe his response in words which will be appropriate. This takes time and the impact of the question can be lost if responses are rushed. Teachers who are uncomfortable with silence often rush in to rephrase the question or answer it themselves. Students, in this situation, soon learn that they can avoid responding by remaining silent. However, by increasing the wait time, the teacher can increase the length and number of obtained responses (Rowe, 1974).

3) Evenly Distribute Questions as Far as Possible to All Members of the Class
It is very easy to just direct questions to those whom one believes can answer the question. Consequently, a few students usually field most of the questions. However, those few who answer most of the questions are probably the least in need of experiencing classroom participation. Explain to students that everyone is expected to participate. Try passing out questions on small slips prior to discussion to give students time to think and to increase the responses of less verbal students

4) Accept All Answers
This does not mean that incorrect answers are praised or allowed to remain uncorrected. If the answer is wrong, the instructor might ask further questions of the same person to prompt further thought. Above all, an instructor should also not belittle student responses to questions. It might be that the question was more difficult than the instructor thought and belittling remarks could bring unnecessary embarrassment to students. For most students just formulating a response and speaking out in class is challenge enough.

5) Avoid Teacher Dominance
In most classrooms, the instructor asks a question; a student responds; the instructor asks another question of another student, etc. The instructor/student interaction can be broken up by encouraging students to respond to one another. An instructor may use redirecting questions to get other students to comment on other students' responses. (See RESPONDING TO QUESTIONS for additional suggestions.)

Summary

The interplay of types and purposes of questions results in questionning patterns that may or may not increase student achievement. However, instructors who plan questions that demand analytical, critical responses from students are more likely to produce higher cognitive functions in students. Planning does not imply that the instructor must prepare rigid lesson plans that will stifle spontaneity and creativity in the class, but that s/he develop a repertoire of questionning behaviors and an awareness of the most appropriate times and methods for implementing those behaviors.

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QUESTIONS AND QUESTION-ASKING

An Annotated Bibliography
prepared by Christine M. Sullivan
Center for Instructional Resources and Improvement

Dauterman, Philip. "Are There Any Questions?" Alberta English '70 (Summer 1970): 20-32.

Asserts that the crucial variable in good classroom teaching is the verbal behavior of the teacher. Through his questioning techniques a teacher can evoke a high level of classroom discussion and force students to go beyond the factual level of comprehension. Author presents some general questioning strategies and then some more specific ones for literature teachers.

Fraenkel, Jack R. "Ask the Right Questions!" The Clearing House 41 (March 1960): 199-203.

What's in a question? Everything! It is a way of evoking stimulating response or stultifying inquiry. Author discusses several different types of questions which teachers may ask depending on the purposes they have in mind.

Gall, Meredith D. "The Use of Questions in Teaching." Review of Educational Research 40 (1970): 707-721.

Surveys the present state of research knowledge concerning the use of questions in teaching. Provides a comprehensive overview of classification of questions, studies of teachers' questioning practices effect on student behavior, students' questions and programs to change teachers' questioning behavior. Suggests additional areas that need to be explored.

Hunkins, Francis P. Involving Students in Questioning. Boston: Allyn and Bacon, Inc., 1976.

"How do I get my students involved with questions and understanding process?" This is a question frequently posed by people involved in teaching. Involving Students in Questioning is a response to this question and attempts to provide teachers with practical suggestions for involving students at any level of education in planning, using, and assessing questions.

Johnson, James, R. and Wilen, William. "Questions and Questioning: Research Studies." Paper presented at the 54th annual meeting of the National Council for the Social Studies, Chicago, Illinois, 26-30 November 1974.

A bibliography of 65 research studies on questions and questioning. Most of the studies are from the late 60's and early 70's; although there is one from 1912. That's how long asking questions has been recognized as a problem area for teachers!

Ladas, Harold and Osti, Louis. "Asking Questions: A Strategy for Teachers." Instructional Issues 56 (January 1973): 174-189.

Cites research, instructional objectives and personal experiences as the data sources to develop a question asking strategy. Uses the sequence of teacher solicitation, pupil response, and teacher reaction as the basic form of the teaching cycle. Provides ways, using these components, to develop a question asking strategy.

Morgan, Jack C. and Schreiber, Joan E. How to Ask Questions. Washington: National Council for the Social Studies, (1969).

Presents guidelines for good questions as well as question asking practices to avoid. The "do's and don'ts" are good. Also an annotated bibliography is included.

Morse, Devin R. and Davis, O.L.,Jr. The Questioning Strategies Observation System. Austin: The University of Texas Research and Development Center for Teacher Education, (1970).

The Questioning Strategies Observation System (QSOS) is designed to record verbal behaviors occurring in the classroom setting which are associated with the teacher's use of questions. Categories are organized around initiation, response, and reaction. Paper covers categories in depth and presents an analytical approach to questioning.

Olmo, Barbara M. "Focus on Questioning." Journal of Teacher Education 21 (Winter 1970): 504-508.

Not only should teachers focus on questioning but also students. Presents two strategies used with prospective teachers in a classroom situation that helped improve questioning for both teachers and students.

Rogers, Virginia M. "Modifying Questioning Strategies of Teachers." Journal of Teacher Education 23 (Spring 1972): 58-62.

Although much research has been done on question asking, very few programs or strategies have been developed to help teachers gain skills crucial to effective question asking. Author presents some strategies and advocates for more.

Sanders, Norris M. Classroom Questions: What Kinds? New York: Harper and Row, 1966.

Presents, in depth, an organized approach to asking questions using Bloom's Taxonomy in the cognitive domain. A very good self-instructional book for any teacher.

Tinsley, Drew C. "Use of Questions." Educational Leadership 30 (May 1973): 710-713.

Bases article on the premise that if a primary goal of education is to develop critical thinking abilities, then teachers must plan, use, and evaluate classroom questions and questioning to better accomplish these goals. Focuses on planning and determining effectiveness of asking questions.

RESPONDING TO QUESTIONS
TABS Item 13)

RESPONDING TO QUESTIONS refers to the instructor's skill at answering students' questions clearly and concisely in ways that promote understanding and further participation. In addition, RESPONDING TO QUESTIONS infers that the instructor is able to create a climate in which students feel free to ask questions and in which appropriate opportunities for asking questions are an integral component of the classroom structure.

Encouraging Students' Questions

In those classrooms where students ask a substantial number of questions, either academic or nonacademic in nature, students tend to demonstrate higher levels of achievement and more positive attitudes toward learning (Stallings & Kaskowitz, 1974). Creating a climate in which students feel free to ask questions depends to a large extent upon the ways in which the instructor structures the classroom situation, solicits student inquiries, and reacts to proffered questions and comments.

Although the instructor may convey a willingness for questions to be asked, s/he will need to structure appropriate times or methods for the asking of those questions. A brief period for students' questions held one minute before the end of class will generally produce only silence and the nervous rustling of papers. On the other hand, open invitations for questions may result in interruptions that prevent the instructor from providing adequate or logical explanations. The most appropriate time for soliciting questions is when students most need to ask them--when their understanding or participation depends upon immediate clarification, explanation, or elaboration. It would be unrealistic to expect the instructor to provide opportunities for questions at times that would meet the needs of every student. However, thoughtful consideration of variables such as class size, difficulty of material, one's own facility for responding to questions, etc., may enable the instructor to make better decisions about when to provide time for students' questions.

Once a time has been determined for the solicitation of questions, the instructor will need to clearly encourage student inquiries. Research by Rowe (1974) suggests that the number of student questions was increased when silence after teacher solicitation was increased from 1 to 3 seconds. Experience with faculty members at the University of Massachusetts has suggested that the number of student questions can also be increased by the use of specifically focused requests for questions. For example, "Are there any questions?" may produce few results, particularly if sufficient time is not allowed for the formulation of questions. By providing more specific cues for appropriate questions, e.g., "Are there any questions concerning how x and y are related?," the instructor may increase both the number and quality of student inquiries (Dauterman, 1970). The instructor who asks "Are there any questions?" but then quickly moves on to new material not only denies students time to formulate their questions, but also gives the impression that the request is a mere formality. It takes

time to construct a question, and the best questions often take the longest to formulate. Thus, the instructor should not interpret initial silence as an indication that there are no questions.

Finally, the instructor must be able to respond to students' questions in ways that promote understanding of the material while maintaining a climate that encourages inquiry. The emotional tone accompanying an instructor's response to questions can either maintain or destroy an atmosphere in which students feel free to ask additional questions or offer further comments. If students sense that the instructor is impatient or angry with questions or that s/he considers such questions to delay the progress of the class, they will soon stop asking them.

When students do have questions that they would like to ask, they will not ask them if they feel they might be embarassed or belittled. The instructor who attempts to elicit questions by saying, "Those of you who missed that item on the last quiz--do you have any questions?" should not be surprised if nobody asks a question. On the other hand, the instructor might say: "This is a difficult concept, but I think it's important that you understand it . . . do you have any questions?" or "This is difficult to explain . . . can anyone formulate a question that might help me clarify it or explain it in another way?" Thus, the instructor reassures students that they will not be seen as ignorant or stupid if they raise questions; on the contrary, their questions may even help the instructor in explaining the material. (See the skills INTERPERSONAL RELATIONS and LEARNING ENVIRONMENT for a more complete discussion of those behaviors that encourage mutual respect and student-teacher interactions.)

Answering Questions Clearly and Concisely

Answering questions often seems like a simple task. However, too often students are left more confused than before the question was asked. Sometimes instructors misinterpret students' questions and respond to completely different issues. Effective answers require careful listening. In their zeal to seize the "teachable moment," instructors sometimes attempt to expand students' questions to include broader issues, and then respond in terms of those issues. The instructor who uses "overkill" in answering questions by launching a 5- or 10-minute lecture, when one or two examples would have sufficed, only produces frustration, boredom, and day-dreaming on the parts of students.

Answers to questions are most useful when they adhere to the following rules for giving effective feedback (Bergquist & Phillips, 1976):

a. Focus on the sharing of ideas and information rather than on giving advice, thereby, requiring the student to determine for him or herself how to use the ideas and information.
b. Focus feedback on exploration of alternatives rather than on answers and solutions.
c. Focus feedback on the amount of information that the person receiving it can use, rather than on the amount that the instructor might like to give.

d. Focus feedback on the value it may have to the receiver, not on the value or release that it provides to the person giving the feedback.

In general, the instructor who answers questions effectively constructs answers that are clear and to the point and checks to see whether or not students have understood before elaborating further or moving on. If the instructor does not know the answer to a question, usually the best thing to do is to admit not knowing. Once the admission has been made, the instructor might redirect the question, promise to think about or investigate the topic further, or refer students to other sources.

Additional Ways of Responding to Students' Questions

There are a variety of types of responses that might be made to students' questions other than answering the questions directly. The instructor should be able to vary these responses according to the nature of the question and the needs of the students.

1) Redirecting
The instructor may prefer to ask the same question of another student rather than answer it him or herself. In doing so, the instructor increases student participation while encouraging students to interact with one another and to view one another as resources. One study of elementary pupils demonstrated a high positive correlation between achievement and the number of questions redirected by the teacher (Wright and Nuthall, 1970).

2) Probing
In probing, the instructor pursues the implications of a particular question or clarifies the original question by responding with another question to the same student. In this way, the instructor may help students to clarify and answer their own questions. Probing questions serve to break down complex questions into series of simpler questions that the student can answer, to suggest analogous situations with which the student is more familiar, or to imply procedures to be used in solving the problem.

3) Repeating the question
Repeating a student's question before responding ensures that all students have heard the question. However, this response should be used with caution. Continually, repeating questions that have been heard and understood the first time can become an irritating mannerism. Moreover, this strategy sometimes has the effect of discouraging students from listening to one another. In classes where interaction among students is desired, it may be more effective to ask students to repeat or clarify their questions when others have not heard or understood.

4) Paraphrasing
Before responding to a question or redirecting a question to another student, the instructor may wish to paraphrase or restate what was conveyed by the question. A more precise answer can be provided when the exact nature of the question is established.

5) Postponing
When a student's question is of interest to only one or a few students in class, it may be suggested that those students consult the instructor or one another after class. An instructor may also suggest postponement of a question if there is not enough time to address it adequately or if the issue raised is to be considered in some subsequent period.

6) Reacting to the question
The instructor may react to the question itself in either positive or negative ways:

a. Praising students for asking questions ("I'm glad you stopped me before I went further;" "I'm glad you pointed out that area of confusion;" etc.) reassures students that they will not be embarassed by displaying confusion or lack of understanding. Praising students for asking controversial or difficult questions ("Now that's really a good question;" "That question shows you're really thinking about these issues;" etc.) encourages thoughtful inquiry and strengthens the tendency of students to ask similar questions. Research studies have demonstrated no clear correlation between praise and student achievement, however, the effect of praise seems to vary with the cognitive style of the student and the nature of the praise itself. Where all questions, regardless of quality, are praised, the occurrence of appropriate questions does not increase and praise loses its value as a reinforcer.

b. Accepting a student's idea by referring to his/her contribution in subsequent discussions is also a positive method of reacting to a student's question. Applying, comparing, acknowledging or summarizing information presented via students' questions or comments has been demonstrably linked to both higher achievement and more positive attitudes in 6 out of 8 studies reviewed by Dunkin and Biddle (1974).

c. Criticism or disapproval of students' questions has been linked in a number of studies to lower achievement. Studies are needed, however, to determine whether criticism leads to lower achievement or whether lower levels of achievement among students increases teacher criticism. Whichever may be the case, the extreme use of criticism and disapproval indicates that something is wrong--with the curriculum, organization, schedule, materials, methods, or attitudes of the teacher in relation to those particular students.

8) Discouraging inappropriate questions
Occasionally students ask questions, not in the quest for clarification and information but in order to get attention, gain recognition, sometimes even to embarass the instructor. Responding to such questions in the ways outlined above may only reinforce behaviors which instructors (and other students) wish to eliminate. On the other hand, responses which, in effect, ignore or criticize these students may discourage them, as well as the rest of the class, from asking questions at all. There is no easy solution to this dilemma. The instructor might look for ways to reinforce more constructive behavior from students, thereby reducing their need to seek attention and recognition. Sometimes, in a private conversation, the instructor may help a student gain insight into his/her behavior and participate more productively. In any case, the decision to respond to a student's question critically should be made only after the instructor has considered the possible effects of such a response.

Effective performance in RESPONDING TO QUESTIONS requires first that the instructor be able to create a climate in which students feel free to ask questions. Second, the instructor must determine when time for students' questions will be most productive and make clear his/her expectations. Finally, the instructor must be able to respond to questions in a variety of ways, to select the type of response that will most facilitate students' thinking about and understanding of the material, and to make that response in such a way as to maintain a climate of open inquiry.

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Also see REFERENCES for the skills of QUESTION ASKING and INTERPERSONAL RELATIONS.

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STUDENT PARTICIPATION
(TABS Items 14, 15, and 16)

Facilitating STUDENT PARTICIPATION refers to the instructor's skills in promoting students' oral participation in classroom activities and in guiding that participation in fruitful directions. Obviously, there are other overt, as well as covert, ways in which students may participate in learning activities--listening, thinking, taking notes, performing a laboratory experiment, etc. But our primary concerns here are with students' verbal participation in classroom activities and with teaching behaviors that promote such participation.

The contexts within which student participation may be desirable range from: class recitation, where students may be asked to answer questions posed by the instructor; to teacher-centered discussions, where the instructor assumes responsibility for directing students' exploration of ideas; to student-centered discussions, in which the instructor's primary role is to facilitate and monitor interactions among students. In any context, the instructor and students should know how much and what kind of participation is desired.

Beyond informing students that their participation is desired, there are certain teaching skills that serve to promote student participation. Asking questions is one such skill. Effective use of centering questions, probing questions, redirecting questions, and processing questions can increase student participation. Moreover, skill in asking questions at various cognitive levels enables the instructor to guide a students' consideration and exploration of ideas or issues. (For a more detailed description of the types and functions of questions, please see the skill area ASKING QUESTIONS.)

Secondly, skill in responding to students who make contributions or ask questions affects student participation. (For a more detailed description of teacher responses to student questions, please see the skill area RESPONDING TO QUESTIONS.) There are several response behaviors that are likely to increase student contributions:

1) Simple Acknowledgment
   Simple verbal statements such as "I see what you mean," "mm-hmm," etc. No evaluation of the idea is given, but the student receives feedback that the idea has been heard.

2) Praise
   Statements such as "good," "right," "that's interesting," etc. Praise may also be given to part of a student's contribution, such as when the instructor says, "Well, I'm not sure all of that is relevant, but what you said about the political implications is certainly worth considering."

3) Restatement
   Repeating, rephrasing, modifying, clarifying, or expanding a student's idea are ways of recognizing an idea and emphasizing its importance.

4) Probing
Using questions which attempt to get students to rephrase, clarify, or expand their ideas serves not only to let students know their ideas are worth pursuing, but also to elicit additional participation.

5) Redirecting
Using questions which invite other students to clarify, expand, or comment upon a student's contribution encourages a greater number of students to participate and to generate interaction among students.

6) Acting upon Students' Suggestions
While opportunities to apply students' ideas or to implement their suggestions may occur less frequently, such direct action can be a powerful reinforcer. The student knows that the idea is worth trying and other students recognize that their contributions will be taken seriously.

7) Preventing Discussion Monopolies
Sometimes student participation is limited because the instructor or a few students monopolize discussion time and extended monologues or engage in conversations which are not of general interest. Cutting short such monologues or esoteric discussions may help facilitate participation from other students.

8) Maintaining Direct Contact
Students can be encouraged to respond to questions or comments by the instructor when non-verbal behaviors indicate instructor attention. Eye contact can be used to encourage the individual response and to redirect student questions. Body movement, use of the board, and position in the classroom may also affect student response levels and patterns.

While these skills are likely to increase student participation, that participation tends to be more or less "teacher-centered." That is, the instructor assumes responsibility for leading students in desired directions, and most interactions will occur between the instructor and individual students. Increasingly, students are asking for opportunities for greater involvement in their learning experience, and many instructors desire to break away from the traditional instructor-dominated classroom and encourage greater student participation and responsibility. Advocates of the discussion method argue that a member of any organized society must be able to work effectively in groups, that students who gain skills in group membership and leadership stand a better chance of operating cohesively and productively in society, and that classroom discussions provide opportunities for students to acquire and develop these skills at the same time as they are gaining mastery of the academic content.

However, classroom discussion methods pose special problems. With the instructor's roles as information-giver and source of feedback limited, and opportunities to provide organization and structure curtailed, it is apparent that a heavier burden falls upon students to carry out these

functions. Unfortunately, it's often the case that students lack the discussion skills necessary to assume these responsibilities, and many discussions are less efficient and productive than the instructor might hope.

The instructor who wishes to increase student participation in discussions and to improve the productivity of discussion groups may find the literature on group dynamics a useful resource. Knowledge of some basic group dynamics principles and skill in using that knowledge can be useful for improving classroom discussions. Study of the interactions in various groups suggests that there are certain discussion behaviors that seem to be common to all effective groups. These behaviors are outlined in the following list of task and maintenance behaviors (Bradford, 1961).

Task Behaviors

Task Behaviors include behaviors engaged in by group members for the purpose of solving the problem or accomplishing the work which the group has undertaken.

Initiating:	offering new ideas relating to the group's task; suggesting how the group might begin to proceed, etc.
Information Seeking:	requesting factual or authoritative information relevant to the group's concern.
Opinion Seeking:	seeking clarification of opinions, beliefs, or values underlying suggestions made or relating to the task at hand.
Information Giving:	contributing facts or authoritative information relating to the group's concern.
Opinion Giving:	stating one's own beliefs, opinions, attitudes, values, etc., which are relevant to the group's concerns.
Orienting:	calling attention to group's stated goals and redirecting discussion when group departs from agreed directions or procedures.
Coordinating:	clarifying relationships among ideas and suggestions pulling ideas and suggestions together; coordinating activities or contributions of various members of group.

Maintenance Behaviors

Maintenance Behaviors include behaviors engaged in by group members for the purpose of building unity and maintaining an atmosphere in which individuals feel free to contribute and communicate.

Gatekeeping:	attempting to keep communication channels open by facilitating and monitoring the participation of group members.
Encouraging:	accepting and supporting the contributions of group members, whether those contributions elicit agreement or disagreement.
Harmonizing:	attempting to mediate differences among group members or to resolve conflicts.
Energizing:	urging or stimulating the group to action.

Knowledge of discussion behaviors may help an instructor in a number of ways. Often, problems in group discussion arise because one or more of the task or maintenance behaviors are not performed by anyone in the group. For example, discussion groups which never seem to accomplish anything because members frequently get side-tracked or go off in many directions may be suffering because no one performs "coordinating" behaviors. Or, discussions which never get off the ground because nobody participates may lack someone to perform "encouraging" behaviors. Knowledge of required discussion behaviors facilitates the identification of causes of common discussion problems and enables the instructor to shift roles and focus upon inadequately performed tasks in order to improve the quality of discussions.

The instructor may use knowledge of discussion behaviors as a tool to help students acquire and strengthen effective discussion skills. Often the instructor must perform many of these behaviors, at least initially, because students are not accustomed to performing them in classrooms. Typically, students have had opportunities to practice giving information or opinions, but their experiences and skills in performing many of the other behaviors are somewhat more limited. The instructor knowledgeable about group behaviors may find opportunities to discuss the various behaviors and roles with students, help them to identify their own role choices, and provide opportunities for them to experiment with and practice alternative discussion behaviors.

Skills in asking questions and responding to students who make contributions facilitate student participation in all classroom contexts. However, because the instructor's role in discussion groups is somewhat different from the traditional teaching role, additional skills are required if those groups are to be productive learning experiences. Group activities in the classroom will be more effective if both the instructor and the students work toward improving their roles in these activities. The

instructor can contribute to improved interactions by becoming more aware of effective task and maintenance behaviors; using and assisting students to use such behaviors; planning precise and thought-provoking questions; and encouraging appropriate student contributions.

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CLASSROOM STRUCTURES THAT ENCOURAGE STUDENT PARTICIPATION
by Tony Grasha, taken from Bergquist and Phillips, 1975

METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Buzz Groups.	Allows for total participation by group members through small clusters of participants, followed by discussion of the entire group.	As a technique to get participation from every individual in the group. Highly adaptable to other group methods.	Prepare one or two questions on the subject to give each group. Divide the members into small clusters of four to six. A leader is chosen to record and report pertinent ideas discussed.	Thought must be given as to the purpose and organization of groups.
Symposium Discussion.	A discussion in which the topic is broken into its various phases; each part is presented by an expert or person well informed on that particular phase, in a brief, concise speech.	When specific information is desired.	Leader meets with the three or four members of the symposium and plans outline. Participants are introduced and reports are given, group directs questions to proper symposium members, leader summarizes.	Can get off beam; personality of speakers may overshadow content; vocal speaker can monopolize program.
Debate Discussion.	A pro and con discussion of a controversial issue. Objective is to convince the audience rather than display skill in attacking the opponent.	In discussing a controversial issue on which there are fairly definite opinions in the group on both sides to bring these differences out into the open in a friendly manner.	Divide the group into sides of pro and con. Each speaker should be limited to a predetermined time followed by rebuttal if desired.	Members are often not objective towards the subject.

METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Experience Discussion.	A small or large group discussion following a report on the main point of a book, article, movie, or life experience.	To present a new point of view or to present issues that will stimulate thought and discussion.	Plan with others participating on how review is to be presented. Then have an open discussion on pertinent issues and points of view as experienced.	Ability of participating members to relate to others and motivate thinking.
Concentric Circle.	A small circle of group members form within the larger circle. The inner circle discusses a topic while the role of the outside circle is to listen. The discussion is then reversed.	As a technique to stimulate interest and to provoke good discussion. This is especially good to get more response from a group that is slow in participating.	Leader and planning group work out questions that will be discussed by the concentric circle and then by the larger circle.	Much thought and preparation must be given to the questions for discussion. Room and movable chairs needed.
Reaction Sheet.	A method of reacting to ideas in the following ways: Ideas that you question; Ideas that are new to you; Ideas that really "hit home."	As a way to get the group to react. Combine this with other methods.	Prepare topic and reaction sheets. Explain and distribute reaction sheets with the instructions to write as they listen, watch, or read. Follow with group discussion.	Topic should be somewhat controversial.

METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Phillips 66.	This is a spontaneous method where six people view their opinions on a topic for six minutes.	To add spice and variety to methods of presentations.	Define topic of discussion. Count off six people and allow six minutes for discussion. Allow for group discussion or reassignment of six people.	Must be used somewhat flexibly.
Reverse Thinking.	Expression of thought by thinking in reverse.	To gain an insight into others' feelings and to see another point of view	Prepare topic—explain to group the theory of reverse thinking. Combine with other methods.	A challenge to group members.
Role Playing.	The spontaneous acting out of a situation or an incident by selected members of the group.	As the basis of developing clearer insights into the feelings of people and the forces in a situation which facilitate or block good human relations.	Choose an appropriate situation or problem. Have the group define the roles—the general characteristics to be represented by each player. Enact the scene. Observe and discuss such things as specific behavior, underlying forces, or emotional reactions.	Group leader must be skilled so that actors will play their roles seriously, without self-consciousness.
Picture Making.	A way of bringing out ideas or principles on a topic by means of simple illustrations made by group members on the blackboard or large chart paper.	As a technique to stimulate interest, thinking, and participation.	Leader and members of planning group select general principles or questions on the topic which would be suitable to illustrate. Leader divides the group into four or five sub-groups. Each sub-group is given a statement or problem to illustrate. After completing the picture making, each group shows and explains the picture. This is followed by discussion.	Instruction must be clear as to the value of picture making and adequate materials supplied.

METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Brain-Storming	Technique in creative thinking in which group members storm a problem with their brains.	To get new ideas, and release individual potentialities in thinking up ideas.	Leader and members of planning group select suitable problems or questions on the topic selected by the entire group. Procedure: The leader explains to the group the meaning of brain-storming and the following rules: Judicial (critical) judgments ruled out. Criticism to be applied later. Quantity of ideas wanted. The more ideas the better chance of good ones. Free wheeling welcomed. The wilder the idea the better; it's easier to tame them down than to pump them up. Hitchhiking is legitimate. If you can improve on someone else's ideas, so much the better. Leader rings bell when one of the above rules is violated. Recorder lists the ideas. Follow-up—type list and bring to next meeting to give to members.	To be utilized as only a part of a class.

CLOSURE
(TABS Items 17 and 18)

CLOSURE is the ability to bring together the major points of a discussion, lecture, or other type of learning activity at the end of a topic or class. The term closure means "to enclose." Performance of this skill at the end of a class or learning activity will help provide a context in which students can integrate new information with existing information, and distinguish major points from minor points within the material for the purposes of memory and future use.. McKeachie (1969) discusses the "students' need for continuity and closure," noting that it is preferable in most contexts to "go through material in a systematic way, building one concept on another."

Closure performs two functions. During class, its application is in the identification of relationships among topics treated previously and those currently under discussion. At the end of a class or unit, providing closure involves summarizing major points and reviewing relationships among them. This cues students to the major concepts in the material so that they are aware of the essential information that they will need for a thorough understanding of the subject.

Closure can be provided in a number of ways. Primarily, it occurs as a summary by the teacher or as a discussion among the students and teacher in which the teacher asks questions that require mastery of the material for response. However, it is not necessarily a function of the instruction alone.

Purposes of Closure

As stated above, closure activities help students recognize the most important material in a learning activity. Its use provides a context in which students can integrate new and previously learned material. Shutes (1969, quoted in Gage and Berliner, 1975) identified four functions of the conclusion of a lecture. These are:

a. to provide for "Social Amenities" during which the teacher can "express pleasure at having been able to teach the class and wish the students luck" (p. 523),
b. to encourage student involvement by asking a student or students to "recall ideas and give examples,"
c. to answer questions asked by students, and
d. to identify the major points of the lecture, discussion, roleplay, etc. specifying what the instructor wants the students to know.

Performing one or more of these closure functions involves a decision based on class size, the students' learning styles and the instructor's teaching style. It is important, as well, to design and implement closure activities that will help the instructor achieve course or class objectives. Specific learning objectives will indicate whether social amenities or summary by the teacher is appropriate to the content and the class.

Closure is an organizational skill in many ways. It is complimentary to ESTABLISHING A LEARNING SET in that it clarifies the context in which the material has been presented, a context which the learning set is meant to introduce. Closure occurs after learning has taken place, and so completes the cycle of continuity identified by McKeachie.

Components of Closure Activities

Shutes has identified correlational relationships between student scores on achievement tests and the presence of the following components of a lecture related to the skill of closure:

--Application of covered material in new problem settings
--Emphasis and planned repetition of major points during a summary
--Announcements of upcoming tests
--Asking students to recall covered material
--Asking for students' questions in reference to covered material

It should be noted that "Shutes reports only correlations . . ." (Gage and Berliner, 1975, p. 525), and not causal relationships.

Application of covered material can be applied in a number of ways. In a lecture presenting a model of communication, for example, the introduction of a new variable in the process at the end of class can provide the instructor an opportunity to review the principles of communication in order to incorporate that variable into the model. In a discussion of managerial behavior, presenting an organizational problem for students to solve will serve to review the principles and issues involved.

Repeating and emphasizing major points during a summary calls for the identification prior to the summary of essential material. This can be accomplished by careful planning before the class, during which the instructor notes the important points or concepts to be discussed that day, and restates them in the summary.

Announcing an imminent examination can help the instructor and students identify and focus on problem areas in the content. Students are likely to ask questions, during the answers to which, the instructor can re-establish the overall context of the material.

One way to involve the students in closure activities is to ask them to recall the major points in the material covered during the class. Most often this activity takes the form of a verbal "quiz," which may work better if anxiety and risk can be minimized so that students feel comfortable responding to the request to state the points. An alternative method is to ask a question requiring students to indicate mastery of basic principles and to apply the knowledge to a new situation. For example, asking, "How would you transform ice into steam?" will address the issue involved in asking "identify the three states of matter," but will also include principles and application that will show thorough understanding and the ability to apply knowledge of physics.

Summary

Closure activities help to organize content for the students so the material proceeds in a logical way among related topics. It can be accomplished in a number of ways, including activities performed by the instructor, the student or both. Introducing closure in the classroom requires clarification of the purposes and components of the material to be included in a particular class session, an assessment of what methods of closure are appropriate to the class and the instructor's teaching style, and the organization of the content into major and minor concepts.

Closure helps students identify relationships among topics and understand the way those topics fit within the subject matter as a whole. An instructor who provides closure to topics and lessons is stating clearly what s/he wants the students to know. Such activities may also serve to identify problem areas within the material that need to be further clarified for the students. Finally, closure is often followed by introducing the topic or activity for the next class. The two activities together serve to provide the framework within which various components of the subject matter can be integrated.

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EVALUATION
(TABS Items 4, 19, 20, and 21)

EVALUATION, as the term is commonly used, has two distinct aspects, only one of which is actually evaluative (Stanley and Hopkins, 1972). The first aspect of what is commonly called evaluation includes the construction, administration, and scoring of tests, and is most accurately referred to as the "measurement" process. The second aspect of evaluation involves interpreting, or assigning values to test scores or to other measures of student learning, and is most properly referred to as the "evaluation" process.

Skill in evaluation thus includes skills associated with the measurement process, and skills associated with the evaluative process. Ebel (1961) discusses some requisites for competency in measurement and evaluation, in which are included the following:

a. knowledge of the purposes of evaluation,
b. knowledge of how to plan and judge a test, and
c. knowledge of how to grade student performance.

Purposes of Evaluation

Evaluation of student learning serves many purposes. From the student's point of view, learning motivation is increased by both the expectation of upcoming evaluation (Feldhusen, 1964), and by the receipt of evaluation results. Bigge (1971) suggests that "a knowledge of progress usually spurs students on to additional effort," (p. 282), and that either praise or blame is better than non-recognition of achievement. Well-designed evaluation procedures provide students with practice in using the material, while promoting overlearning of material which facilitates retention (Krueger, 1924). The outcomes of evaluation help students to identify areas in which further study is necessary.

From the teacher's point of view, evaluation provides feedback which is useful in assessing both student learning and the success of particular teaching strategies that have been used. Outcomes of testing indicate where students need further help and suggest better designs for future courses. Furthermore, the process of constructing a test stimulates the teacher to clarify and refine meaningful course objectives.

From an administrative point of view, evaluation provides a useful means for certifying competence or mastery. The outcomes of evaluation are useful bases for making decisions concerning future plans, such as employment or continued education.

Planning and Judging a Test

Consideration of objectives--Clarity of teaching purposes is critical to evaluation in that these purposes guide the selection of evaluative procedures. When examinations are the basis for evaluation, course purposes should direct choice of both the kind of examination and the nature of the examination items.

Recent literature in the field of education has emphasized the importance of clearly defining such purposes. One of the best known approaches focuses on the development and use of "instructional objectives" in course design. An instructional objective defines the purpose of the course, usually in terms of expected learning outcomes, that is, in terms of what students should be able to do as a consequence of their learning. Objectives which specify course purposes in terms of student behavior are referred to as "behavioral objectives."

The literature describing kinds of instructional objectives, and ways to clarify and implement objectives, is abundant and varied. A classic in the field is The Taxonomy of Educational Objectives by Bloom and his colleagues (1956), which classifies educational objectives into three general "domains"--cognitive, affective, and psychomotor. The cognitive domain, which includes intellectual abilities and skills, is subdivided into six hierarchical levels of understanding--knowledge, comprehension, application, analysis, synthesis, and evaluation.

Works by Gronlund (1970) and Mager (1962) describe ways in which instructional objectives can be developed, clarified, and implemented both in instructional and evaluational procedures. Gronlund (p. 20-1) provides a useful table which suggests behavioral terms which are relevant to each of the six levels of Bloom's cognitive domain of objectives. These behavioral terms suggest test items which are appropriate for different kinds of objectives. For example, if the course objective is student "knowledge" of a subject, the teacher might test by asking students to "define, describe, list, or state" information about that subject. However, if the course objective has to do with abilities to "evaluate" a subject, test items might ask students to "appriase, compare, criticize, or interpret" course material. Bigge (1971, Chapter 12) also provides a table which suggests the kinds of tests, and test items, which are appropriate for different teaching purposes.

Writing technically-correct test questions--Clear understanding of teaching purposes, and choice of examination designs consistent with these purposes, must be accompanied by the development of clearly interpretable test questions. As Milton and Edgerly (1976) point out, "A test's purpose is to test or measure knowledge rather than verbal puzzle-solving ability."

The writing of technically-correct test questions is a skill which requires knowledge of some basic principles and practice at using those principles. The following illustrate some frequently mentioned principles.

a. In wording questions, strive for verbal clarity. Clarity can be checked by a colleague or an advanced student.
b. Questions should be stated as concisely as possible, and all unnecessary words should be omitted. Extra words tend to confuse students.
c. Make sure the question doesn't clue the correct response, especially when a multiple choice question is used.

d. Avoid the use of negatively worded questions--they tend to confuse students.
e. In designing multiple choice questions, answer alternatives should not overlap or include one another.

These principles, as well as others, are elaborated and illustrated in The Testing and Grading of Students by Milton and Edgerly. Further discussions of the writing of test items is provided by Ebel (1966) and by Barton and Gibbons (1972). Stanley and Hopkins (1972) include chapters describing the construction of essay tests and of multiple choice tests.

Criteria for judging a test--Experts in measurement and evaluation usually judge tests in terms of two criteria--validity and reliability. A test is valid if it measures what it is supposed to measure. In educational evaluation, the type of validity which is of greatest concern is content validity (Stanley & Hopkins, 1972). Content validity is usually assessed by examining the consistency between teaching purposes and test items. If the test items reflect these purposes, content validity is likely to be high.

A test is reliable if it would produce consistent results when readministered, given no change in student learning. Test reliability is likely to be high when test items are technically correct, so that they are interpreted in a consistent way. Basic discussions of the concepts of validity and reliability are available in Stanley and Hopkins (1972).

Grading Student Learning

After examinations have been constructed and administered, evaluation in its truest sense occurs. The grading of student performance involves judging the quality of that performance--assigning a value to it. To be most useful to students, grading of their performance should occur periodically throughout the course. Furthermore, the basis for grading should be clearly understood by both the teacher and the students. The basis for grading can be clarified by considering: a) what grading categories will be used? and b) what will be the referent for applying the categories to student performance?

Categories for grading vary widely, ranging from systems where performance is marked A, B, C, D, F, to two-category Pass-Fail systems, to systems where the percentile test score is the grade. Most teachers are constrained by the conventions of their institution. However, where choice of grading categories is possible, student needs and potential uses of the grades should be considered. For example, where there is considerable interaction between student and teacher, letter grades may be unnecessary. However, students who expect to attend graduate schools may find judgment in terms of a multi-category grading system more useful.

Discussions of applications of grading systems to student performance has recently focused on comparisons of "norm-referenced" versus "criterion-referenced" grading. Norm-referenced grading, popularly referred to as

"grading on a curve," involves judgment of an individual's performance relative to that of others. Only a certain proportion of students can receive high grades, and these are the students who perform on tests or other graded work relatively better than their peers. Most standardized tests of achievement or intellectual abilities are norm-referenced. When grading is criterion-referenced, the individual's performance is judged relative to some clearly stated criteria, usually in the form of instructional objectives. The closer the student comes to achieving these objectives, the higher is his grade. The meaning of the individual's performance is not dependent upon the scores of others, and there is no limit to the number of students who can receive high grades if they achieve the stated objectives. The Red Cross Senior Lifesaving Test is criterion-referenced in that individuals must achieve certain specified criteria in order to pass.

Considerable discussion has focused on the relative merits of criterion-referenced and norm-referenced grading, and their implications for test design. Popham (1971) provides descriptions of criterion-referenced testing and grading theory; Popham and Husek (1969) compare the two procedures. Ebel (1972) points out some of the difficulties with criterion-referenced grading and testing.

Concluding Remarks

The above discussion has attempted to summarize some skills which are important for the successful evaluation of students. The discussion has focused on the use of written tests, a most common evaluation procedure. It should be noted, however, that alternatives other than written tests are available. For example, class presentations, papers, or written projects may be most useful for encouraging students to synthesize and evaluate a body of material. For highly individualized instruction, the student and teacher may negotiate a learning contract, which specifies learning goals, methods, and evaluation procedures. In all of these examples, as with written tests, teaching-learning objectives should guide the selection of evaluation procedures.

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LEVEL OF CHALLENGE
(TABS Items 22, 23, and 29)

LEVEL OF CHALLENGE refers to the instructor's skills in selecting course objectives, content, and activities that challenge students' abilities but that are not too difficult for students to master. An appropriate level of challenge is essential for holding students' interest. If the material is too difficult, students may become discouraged, frustrated and inattentive; if material is too easy, students may become bored and restless. LEVEL OF CHALLENGE involves not only the preplanning of courses but also those adjustments that the instructor may find it necessary to make as the course or particular class session progresses.

Planning the Course

A study by Taylor (1970) of 261 British teachers indicated that course planning involves decision making in four areas:

1) Teaching Considerations
   Teaching methods that may be employed
   Materials and resources to be used in teaching
   How teaching time will be used
   Selecting and ordering of the subject matter

2) Student Learning and Interest Considerations
   What students are intended to learn
   Knowledge, principles, and skills to be achieved
   Subject matter to be included
   Ordering of the subject matter

3) General Purpose Considerations
   Aims of the Course of Study
   General philosophy held about teaching the subject

4) Evaluation Considerations
   How successful similar courses have been in the past
   Criteria to be used in judging the effectiveness of the course
   Interests and attitudes of the pupils

Taylor's analysis led him to conclude that instructors should begin their planning with "What concerns them most, i.e., what they are to teach" (p. 75).

Following consideration of what and how one is to teach, the instructor will need to consider individual student needs. Students in a class enter at different levels of achievement and learn at varying paces. Cognitive psychology suggests that the single most important factor in determining achievement is what the student already knows (Ausbel, 1968) or his/her prerequisite capabilities when he encounters a new material (Gagne, 1970). As a result of this, an instructor needs to design a course with different

levels of challenge in the content. In other words, the content level should be reflective of the cognitive and affective level at which students are capable of operating. In recognition of student differences, an instructor may design a number of questions, readings, activities, etc. which are at varying levels of difficulty. (Please refer to the skills of ASKING QUESTIONS and INDIVIDUALIZATION.)

Planning, however, can produce undesirable rigidity. A study of the results of planning and nonplanning on the solicitation and use of student ideas (Zahorik, 1970) showed that planning teachers more frequently summarized, repeated, and shaped students' responses to reflect their own views. In addition, more topics were introduced by planning than by nonplanning teachers. The latter more frequently asked students to expand their ideas or gave some expansion to students' ideas themselves. Teachers should beware of trying to achieve what they have planned at the expense of what students can contribute to the learning situation (Gage & Berliner, 1975).

This does not mean that instructors should not plan, but that planning ought to include not only the goals, experiences and evaluation processes but also conscious methods for opening up class discussions, soliciting students' comments, and expanding on students' ideas. The importance that this latter assumes for any given course depends entirely on course objectives, students' characteristics and the teacher's own beliefs and skills.

Implementing and Adjusting Plans

As mentioned above, the appropriate level of challenge is likely to be different for each student. This makes it difficult for the instructor to determine how to select the course content. Typically, decisions concerning level of challenge are made far in advance of the course, irrespective of these individual differences. The result is that students become disinterested or frustrated and the course is unsuccessful. As the course progresses, however, the instructor may employ a number of methods to determine whether or not adjustment in the level of challenge is necessary.

Strategies for Testing and Adjusting the Level of Challenge

1) Clarifying Expectations

Allison and Ash (1951) suggest that student learning can be increased by telling students (in this study prior to viewing a film) that the material to be covered is important and difficult. Similarly, Gage and Berliner (1975) suggest that by telling students that material is difficult but understandable or solvable, the instructor can increase self-reinforcement when students succeed, and decrease self-punishment and loss of self-esteem, when they fail. If students succeed with what they are told is easy, self-reinforcement is slight. If they fail under these conditions, self-punishment and the loss of self-esteem is great.

2) Pretesting

Pretesting is an effective method for determining the level of information and ability brought to a class by a particular group of students. Pretests can help an instructor in determining the amount of material to include in the course, the difficulty level of that material, and the pace at which it should be presented. Emphasis here on the use of a pretest is not meant to imply that the course should not be designed before giving a pretest. On the contrary, good courses are designed well in advance of the time that they are to be given. However, the design should be made with enough flexibility to be able to respond to assessed student abilities. In this fashion, courses become more attuned to student needs.

Generally, pretests are given during the first class of the course, and can be designed to answer two basic types of questions. One has to do with whether or not students have the necessary learning skills for undertaking the course. For example, are students good note-takers? Can they organize for themselves what has been said? Can they read rapidly with good comprehension? The other type of pretest is designed to assess the knowledge that students already have relative to the course. Have students covered the material before? Have they touched upon it in other related courses? Is the material completely unfamiliar? Again, by determining the entering level of knowledge, an instructor will be able to design learning experiences for the course more appropriately.

3) Conducting Periodic Checks or "Dip-sticking"

Periodic checks on student progress may be used as a course or class session progresses to determine the optimal level of challenge. Students may pick up the materials far more quickly or slowly than the instructor expected, indicating that adjustments are needed.

a. Questions scattered throughout a class session can provide feedback to the instructor on how well students are understanding the materials under consideration. General questions such as "Are you with me?" or "Is anyone confused?" do not tend to produce adequate information. Instead, questions should be specific, requesting students to review or to practice using course material. A study of the effects of questioning on student learning (Berliner, 1968) found that groups receiving questions and attempting answers during a lecture performed better on short-term and long-term tests of recall than did groups engaged in the customary lecture activities of notetaking or paying attention.

b. The instructor may also check on the accuracy of his/her level of presentation by requesting questions from students concerning the material being covered. In order to assist the students to clarify and verbalize their questions, the instructor will need to pose his/her request in a specific manner ("Are there any questions concerning the ventilation systems in the fish that we have covered?") and then allow sufficient time for thoughtful consideration by students.

c. At planned points in a lecture or discussion, the instructor may wish to provide an opportunity for students to use themselves or their peers as sources of feedback. An instructor may pose a question and have students jot down the answer. Lists could be compared with the responses of a peer or by checking back in one's notes. A show of hands could communicate to the instructor what proportion of the class had recorded the correct answer. If that proportion were low, the instructor might need to elaborate on or review the material in question in order to assure student comprehension.

d. No fault quizzes. No-fault quizzes are non-graded quizzes used to provide feedback to both the students and the instructor on the rate at which new material is being mastered. Because they do not require extensive hours of grading (answers are provided immediately either verbally or in writing), feedback is instantaneous and if so desired, frequent. No-fault quizzes give an instructor an idea of how the students as a group are doing, and as such may be used to determine whether or not alterations in the course need to be made.

e. Checking student non-verbal cues. When students appear to be puzzled, frustrated, or restless, it could be a sign that the material is either too easy or too difficult.

Summary

LEVEL OF CHALLENGE refers to the instructor's selection of course objectives, content, and activities that are at an appropriate level of difficulty for students. Proper level of challenge may be determined through the use of pretests of student learning skills and/or content knowledge and periodic "dip-sticking." At the proper level of challenge, a course will be much more interesting to both students and the instructor.

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VARIETY IN METHODS AND MATERIALS
(TABS Itmes 24 and 25)

Skill in using VARIETY IN METHODS AND MATERIALS involves knowledge of a) purposes for using variety, and b) ways in which methods and materials can be varied.

Knowledge of some possible reasons for including a variety of teaching methods and materials in one's classroom design is necessary for the most appropriate selection of specific materials and methods. This description explores four rationales for the inclusion of variety in the classroom.

1) To Accomplish Various Instructional Goals

A variety of methods and materials can be used to accomplish different instructional goals. Because teaching methods vary in their effectiveness for accomplishing different instructional goals, consistency between goals and methods is important if goals are to be achieved. This implies that the teacher may need to vary teaching methods or use of teaching materials in order to accomplish different types of teaching goals. One framework illustrating these ideas is provided by Gronlund (1970) who suggests student behaviors appropriate for different kinds of teaching objectives, as classified by Bloom and his colleagues (1956). For example, if teaching is focused on the communication of knowledge about a subject, teaching activities might ask students to "define, describe, or identify" information about that subject. However, if critical abilities are being taught, teaching activities should encourage students to "appraise, interpret, or justify" presented ideas.

Another useful conceptualization is the objectives-methods matrix provided by Gage and Berliner (1975), and presented in Table 1 in an adapted version. Regardless of which procedure is used, teachers should be aware that different teaching methods and materials accomplish different purposes, and that they should be selected accordingly.

2) To Meet the Needs of Various Types of Students

A variety of methods and materials can be used to meet the needs of students with different learning styles. Most students have preferences as to the teaching method they find most effective and interesting. A useful conceptualization of students' learning style differences is provided by Tony Grasha and Sheryl Riechmann (Bergquist & Phillips, 1976) who have developed a questionnaire to classify students according to the classroom behaviors. The six learning styles distinguished by this questionnaire are:

TABLE 1

An Objectives-Methods Matrix, Showing Estimated Appropriateness of each Major Method for each Level of Educational Objective*
(Adapted from Gage & Berliner, 1975, p. 488)

	Teaching Method				
	Lecture	Student-centered Discussion	Teacher-centered Discussion	Individual	Experimental
Level of Educational Objective					
Knowledge	B	C	B	A	C
Comprehension	B	B	B	A	C
Application	C	A	B	A	B
Analysis	C	A	B	A	B
Synthesis	C	A	B	A	B
Evaluation	D	A	B	C	B
A = Excellent, B = Good, C = Fair, D = Poor					

*See the skill definition of ASKING QUESTIONS or SET INDUCTION for further elaboration of each educational objective.

Student Learning Style	Suggested Teaching Method[1]
Independent	
--This response style is characteristic of students who like to think for themselves. They prefer to work on their own, but will listen to the ideas of others in the classroom. They learn the content they feel is important and are confident in their learning abilities.	Modular, self-paced instruction, such as Keller plan or audio-tutorial minicourses Independent Study Contract Teaching Individual projects
Dependent	
--This style is characteristic of students who show little intellectual curiosity and who learn only what is required. They see teachers and peers as sources of structure and support. They look to authority figures for guidelines and want to be told what to do.	Lecture Structured problem-solving Question and answer sessions focused on the teacher Audio-visual aids
Collaborative	
--This style is typical of students who feel they can learn the most by sharing their ideas and talents. They cooperate with teachers and peers and like to work with others. They see the classroom as a place for social interaction as well as content learning.	Peer teaching Buzz groups Small group projects Role playing[2]
Competitive	
--This response style is exhibited by students who learn material in order to perform better than others in the class. They feel they must compete with other students in the class for the rewards of the classroom, such as grades or teachers' attention. They view the classroom as a win-lose situation where they must always win.	Simulation and gaming Debate discussion Phillips 66[2] Reverse thinking[2] Learning cell
Participant	
--This style is characteristic of students who want to learn course content and like to go to class. They take responsibility for getting the most out of class and participate with others when told to do so. They feel that they should take part in as much of the class related activity as possible and do little that is not part of the course outline.	Panel or symposium[2] Problem-solving activities ndividual projects Lecture Brainstorming[2]

[1]For details on these methods see the attached "Summaries of Eight Common Course Designs."

Avoidant	
--This response style is typical of students who are not interested in learning course content, at least in the traditional classroom. They do not participate with students and teachers. They are uninterested or overwhelmed by what goes in in their classes.	Individual learning contracts Field experiences Reaction sheet[2] Placement exams

[2]For details on these methods see skill definition for STUDENT PARTICIPATION.

Choice of a teaching method that is congruent with predominant student learning styles will allow most students to easily take advantage of the teaching method, but will not encourage the development of new learning skills. Choice of a teaching method that is not preferred by most students, or with which they may be unaccustomed, may require some extra planning in order to prepare students to take advantage of the teaching method. By using a variety of teaching methods and materials, the teacher is assured that at least some of the time, each student is being taught in a way that is most effective for him or her.

3) To Increase Student Attention
A variety of methods and materials can be used to maintain attention to course activities and purposes. In order to teach successfully, the teacher must be sure that students are continuing to follow class or course activities. This is an especially important teaching function, for, as Davis (1976) points out, "Before we can assimilate any information, we must attend to it" (p. 41). One way to direct and maintain student attention is through use of a variety of teaching methods and materials, which provide changes in stimulation that are likely to hold attention. The teacher also increases the probability that at least some of the time, each student is being taught in a way that s/he finds most interesting.

4) To Provide for the Professional Development of the Instructor
A variety of methods and materials can be used to allow teachers an opportunity to develop and refine their skills and knowledge. Attempts at exploring different ways of teaching allow the teacher to discover more about his/her strengths and weaknesses as a teacher. In addition, variety which encourages student participation may provide more opportunities for the teacher to interact and learn from his/her students. Just as variety in teaching methods stimulates student attention, such variety also maintains the teacher's enthusiasm, and reduces the possibility of becoming bored with teaching.

In selecting teaching methods, therefore, the teacher may want to consider which teaching method s/he is most interested in using. The choice may depend on what methods have been used previously, the success of those methods, and the nature of new competencies that the teacher wishes to develop.

A Summary Model

The previous discussion has mentioned a variety of possible teaching methods and materials and has stressed the importance of systematically choosing appropriate teaching methods and materials. To help organize these ideas, the following model is suggested:

1. Specify the goal of instruction;
2. Generate possible teaching methods and materials for achieving this goal;
3. Consider the importance of the following factors.
   a. student learning styles
   b. teacher methods previously used
   c. teacher interests
   d. environmental restrictions
4. Select the teaching method and teaching materials that seem most appropriate, given the instructional goals and consideration of the above factors.

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SUMMARIES OF EIGHT COMMON COURSE DESIGNS

1. *Lecture:* This is, of course, the most common form of teaching in higher education. It probably needs no further introduction except to say that there are many variations on the process. Most lectures, however, have the instructor spending the majority of his time sharing information with students in essentially a one-way communication process. That is, the dialogue is from the instructor to the student, with the student placed in a listener role. Student questions and answers are welcomed and an occasional discussion occurs between students and the instructor.

2. *Small Group Learning Experiences:* These techniques share the goals of actively involving students in the learning process as well as increasing the students' interpersonal and group problem-solving skills. Examples of such techniques are:

   a. *Class Discussions.* Next to the lecture, this is probably the most frequently used classroom technique in American colleges and universities and needs as little introduction. Class discussions generally involve the instructor asking questions of and responding to one or more of the students in the class. At times extensive discussion may take place between students, but usually the dialogue focuses on the instructor.

   b. *Buzz Groups.* Small sub-groups of students are given a series of questions, topics, or problems to discuss and work on. Each sub-group is asked to come to some kind of resolution with regard to a given question, topic, or problem. Students might be asked to develop a solution in one class period or over several. In either case, the small groups are usually asked to report to the larger class. At this time, comments and discussion from other students are welcomed. The groups are often required to write up the results of their discussion activity. Student panel discussions can also be used to present information in the context of such a design.

   c. *Group Courses.* Small groups of students are asked to design a course of their own for a given period of time, such as two weeks, a quarter, or a semester. The students are responsible for teaching themselves or for obtaining adequate resources for teaching certain topics. Faculty participation varies depending on the needs of the students and teacher. The faculty member is often helpful in making suggestions to the students. The technique is particularly effective after the students have had some previous exposure to the material. Also, when using this approach, it is best to have students initially design small amounts of time. Once they have gained some experience at this, the amount of course time they design is gradually increased.

3. *Keller Plan:* The Keller Plan is a self-paced, student-tutored, and mastery-oriented instructional design. Printed study guides are used for communication, and a few lectures are given by the instructor usually for stimulation and motivation of students.

   A student entering a Keller course finds that the course work is divided into clearly defined topics or units. *In a simple case,* the content of a unit may correspond to a chapter in the text. Study guides are used to guide or direct the student's work on each unit. Study guides introduce the unit, state student objectives for the unit, suggest study procedures, and list study questions. The student may work anywhere to achieve the objectives outlined in the study guide.

   Before moving on to the second unit, the student *must demonstrate mastery of the first unit by perfect or near-perfect performance on a short examination.* The student

requests the exam when he feels prepared. Each unit must be passed before subsequent units can be attempted. Students may meet all course requirements before the term is through, or the student may take more than a term for completing the course. How much time is allowed is usually an instructor option.

The staff needed for implementing such a plan includes an instructor and undergraduate tutors. The instructor selects and organizes material used in the course, writes study guides, and constructs the examinations for the course. A few lectures or demonstrations may be given during the course. *The lectures are not compulsory and no examinations are based on them.* They are used to stimulate the students or, in some cases, to motivate the student to do well. That is, attendance at a lecture is sometimes made dependent upon the student successfully completing and passing the unit or units that the lecture covers. When given, the lectures must be special.

The undergraduate tutors are usually advanced majors in the field or people who have done well in the course the year before. Tutors evaluate readiness tests as satisfactory or unsatisfactory. They also prescribe remedial steps for students who encounter difficulties with the course material and offer support and encouragement for new students. In large courses where graduate assistants are available, the assistants are often used to supervise the tutors and to deal with issues that the undergraduate tutors cannot handle.

4. *Simulation Techniques:* Here the course is taught through devices which attempt to reproduce in a controlled fashion the real world. This can include mock jury situations, a complex criminal justice organization, an economic system, a ghetto environment, or numerous other situations. Students are asked to play various roles, and problems typical to the situation are introduced for the students to solve. The emphasis is on the application of content learned through reading and studying in a controlled situation. Simulation techniques are available commercially or they can be custom designed by the instructor.

5. *Modular Instruction:* The basic concept involves offering individual units that cover major content areas of a course. Each unit is a curriculum package designed for self-study. A set of units may be completed in some particular sequence, or students may choose from several modules at any particular time. Time limits may be set for completion of each module or students may be allowed to complete units at their own pace. The learning units are usually large, each requiring several hours of the students' time. The instructor's role is limited to developing the modules and to monitoring their use. Audio-visual tutorial aids may be used as part of a module but their use is not essential.

   The following steps are used in developing a module: (1) A minimum number of objectives are stated, preferably in terms of observable behavior. (2) A hierarchy of these objectives, which determine the sequence of instruction, is constructed. (3) A pre-test is constructed to determine what competencies each student possesses when entering the module and to help the student focus on areas he is relatively ignorant about. (4) A rationale for the module is articulated. This involves a statement about the value of a particular unit and explains to the student why it is beneficial for him to achieve the stated objectives. (5) Instructional activities are designed to help the student acquire the competencies stated in the objectives. (6) A post-test is given so that the student can assess how much he has learned from the modular unit.

6. *Peer Teaching:* This refers to techniques which use students to help other students learn. Two examples of this are:

a. *Teacher of the Day.* Students are divided into several small groups. The instructor designs a schedule for the course with a clearly defined topic scheduled for one to two class periods. Responsibility for teaching that topic rests with a designated student in each of the groups. Each small group on a given day has the same topic being taught by one of the group members. After completing a topic, one session is spent with each small group leader summarizing for the entire class how he taught the topic and sharing the major points that were taught in their group.

The instructor may sit in on groups or may answer particularly hard questions that the student teachers cannot. To ensure that quality instruction takes place, *the instructor must monitor closely the work of the student teachers.* They should receive feedback on their performance and they should be given tips on how to improve the next time they are assigned a topic to teach. During a course, students may be expected to teach two to three times. Part of their grade is based on their teaching performance. Examinations are given at normal times but both the instructor and the student teachers write exam items.

b. *The Learning Cell.* Students are divided into pairs and are given or choose a specific but common assignment for each classroom period. They then read the assignment on their own. Each student then prepares questions relating to the assignment before the next class meeting. Questions should deal with the substantive content of the assignment, applications of the content, or new ideas suggested by the material. The pairs take turns asking each other their series of questions. The instructor should collect carbon copies of the questions and give students some response to the adequacy of the type of questions they are asking. Exams can be given in the usual manner, but students should be allowed to submit exam items. To help maintain interest, pairs should be rotated periodically.

A variation of this technique is for each student to have read a different assignment. Part of the time is spent with one student explaining what he read and then asking the other questions. The roles are then reversed, with the other student explaining and then questioning.

7. *Contract Teaching:* In this model, each student contracts or agrees with the instructor on how much work he will do in the course. The contract or agreement need not be written but it can be. The agreement should have a clearly understood set of specific responsibilities for both the student and the teacher to fulfill. Each student may have a different contract (a planned set of projects to complete, number of classes to attend, number of exams to take, exam performance that will be achieved, and so forth). The contract or agreement may be designed as a joint effort by the students and teacher, or the teacher may present a contract for acceptance the first day of class. The latter can be done by specifying clearly the amount of work and types of activities that are expected for different grades. Students are asked to indicate within a week what grade they want to work for in the course.

8. *Tutorial Teaching:* Here the instructor meets with students individually or in small groups. The topics chosen for study are jointly agreed upon by the instructor and students. The amount of faculty guidance and faculty-student interaction varies depending on the needs of the particular faculty member and students involved. Students usually take a lot of responsibility for presenting and sharing ideas with the instructor. The instructor shares ideas but usually spends a good deal of time helping the students to sharpen their thinking. Students are usually required to do some type of writing or research project as part of the tutorial.

* Summaries of Eight Common Course Designs (written by Tony Grasha, in W. H. Bergquist and S. R. Phillips, A Handbook of Faculty Development, the Council for the Advancement of Small Colleges, Washington, D.C., 1975.)

CREATIVITY
(TABS Item 26)

CREATIVITY in classroom instruction refers to both a process and a product. Although the world of art imbues the term with a mystique of intangible and innate genius, CREATIVITY is simply the restructuring or recombining of existing forms or knowledge to produce insight.

The mind functions to create patterns out of experience. Once formed, these patterns are used by the learner to handle new information as well as familiar situations. The learner can combine or add to patterns with ease. However, it is more difficult to restructure those patterns since they control what the learner attends to (deBono, 1970). CREATIVITY involves the restructuring of these patterns to produce "essential surprise," new ideas, and changes in attitude and ways of looking at one's surroundings. Douglas-Brown (1968) translates this into the classroom by stating that "the teacher must constantly find new ways to communicate old ideas and to nurture the development of ideas and understanding in his students" (p. 164). The instructor, by working to produce a learning experience that is novel, appropriate, thought-provoking, and more complex than initial observation would suggest, may increase student attention to the material that is to be learned (Messick, et al., 1976). Once insight has occurred, the learner will be able to make the best possible use of available information because s/he is no longer restricted to existing patterns in the interpretation of experience and the solving of problems (Bruner, 1962).

Creativity as Lateral Thinking

In order to both demonstrate and evoke creative problem solving behaviors in students, the instructor will need to structure activities within the learning experience that increase lateral as opposed to vertical thinking (Harris, 1973). Lateral thinking is not a substitute for vertical thinking, but a complement. Vertical thinking develops the ideas generated by lateral thinking. Vertical thinking digs a hole deeper; lateral thinking digs a hole in a new place.

Methods that encourage lateral--as opposed to vertical--thinking are characterized by the following dicotomies:

LATERAL THINKING	VERTICAL THINKING
generative	selective
provocative	analytical
directionless	directed
nonsequential	sequential
welcoming the irrelevant	restricted to the relevant
probabilistic	finite
does not include negatives	includes negatives
not restricted by correctness	restricted by correctness

Traditional instruction has focused on the development of vertical thinking or analytical problem solving. While these skills are essential to the acquisition of knowledge, skills in creative thinking are equally essential to problem solving. Through the use of instructional methods that embody the characteristics of lateral thinking, the instructor may not only increase his/her own insights and creativity, but can encourage the same in his/her students.

Techniques

The following techniques are processes that can be utilized by the instructor in designing a course or by students within a course as an opportunity for practicing creative thinking. As such, the techniques do not suggest a specific content, but instead, an approach to the communication and discovery of appropriate content, particularly in the area of problem solving.

1) Generation of Alternatives
The instructor poses a problem and sets a required quota to be reached in the generation of alternative approaches to solving the problem. The emphasis is not on actually solving the problem but on finding different ways to set it up for eventual solution.

2) Challenging Assumptions
The instructor begins with a "why" question. Each response is probed with a "why" focused on some aspect of the previous response. No response is so obvious that it merits an automatic acceptance. The intention is to create discomfort with any explanation.

3) Design Projects
The learner is asked to visually design an improvement on existing things or an actual invention for carrying out a designated task; e.g., design a device to help solve world food shortages; redesign the human body to survive in a low oxygen environment.

4) Reversals
In order to provoke new ways of looking at a situation, the instructor asks learners to take a situation, turn it around, inside out, upside down, back to front, e.g., a teacher organizing class activities . . . the activities control the teacher . . . the teacher disorganizes the activities . . . etc.

5) Brainstorming
The instructor presents a problem and participants offer possible solutions. All judgments are suspended. Any idea is accepted and noted down. As it is best to stop the session while ideas are flowering, 20 to 30 minutes is generally enough. The brainstorming session is followed by an evaluation session during which ideas are classified as a) immediately useful; b) worth further exploration; or c) new approaches to the problem.

6) Analogies
The instructor poses a problem and begins to develop an analogy. Students are asked to volunteer how any particular development in the analogy relates to the given problem.

7) Additional techniques are included in Edward de Bono's Lateral Thinking: Creativity Step by Step.

Summary

CREATIVITY in the classroom refers not only to the instructor's skill at structuring information and experiences in viral and unexpected ways but also to the effect such methods have on the creative thinking behaviors of students. Lateral thinking techniques may be used by the instructor to restructure his/her own classroom activities or implemented within a class to encourage creative and insightful thinking behaviors in students.

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CLASSROOM MANAGEMENT
(TABS Item 27)

CLASSROOM MANAGEMENT refers to the performance of those day-to-day administrative tasks that allow instruction to proceed smoothly and efficiently. In addition, effective CLASSROOM MANAGEMENT involves knowing one's students and properly blending the use of various teaching skills with the needs and abilities of those students.

The Instructor as Administrator

The central role of the instructor as administrator involves the performance of such routine tasks as correcting examinations, evaluating student papers, providing appropriate materials, announcing course details, scheduling course activities, etc. Such tasks may seem unimportant or insignificant, but if neglected or overlooked, they may lead to student dissatisfaction, frustration, or confusion within the learning situation.

The Instructor as Leader

Although the TABS item referred to in this skill refers to the performance of day-to-day administrative tasks, the instructor is also confronted in the classroom with a second dimension of management, the management of human resources. Of all the tasks of management, managing the human component is the central and most important task, because all else depends on how well it is done" (Likert, 1967). Kounin (1971) has identified the following behaviors as indicative of successful classroom leaders in any type of instructional situation:

a. alertness to what is going on in the classroom;
b. ability to sustain more than one activity at once (e.g., lecturing and observing students' reactions);
c. ability to maintain continuity without confusion;
d. ability to sustain proper pacing while maintaining group momentum;
e. ability to keep the group alert;
f. success at holding students accountable for learning and attention;
g. ability to generate enthusiasm;
h. ability to provide variety in work assignments and classroom activities.

These behaviors were also shown to be related to gains on standardized achievement tests by Brophy and Evertson in 1974.

In selecting appropriate leadership styles, the instructor will need to consider the maturity level of the classroom group as a whole as well as the nature of the task at hand. The need for varying degrees of external and internal controls, attention to aspects of the task or the relationships among group members, and guidance vary from group to group. The effective leader will need to develop strategies for assessing the needs and abilities of his/her students (see VARIETY OF METHODS AND MATERIALS and INDIVIDUALIZING INSTRUCTION) and to plan learning experiences based on the data collected.

Summary

Whether the issue is one of administration or leadership, advance planning is essential. If learning events are to occur when, where, and as appropriate, the instructor must identify desired resources, decide where each fits into the instructional sequence, and arrange to have them available. Such resources may include handouts, audio-visual materials, guest speakers, laboratory equipment, etc., for use within the classroom. They may also include extra-classroom things such as texts and other readings, space and equipment for research, practicum sites, etc. All of these must be identified, prepared, ordered, and made available in sufficient quantity when needed. As even the best laid plans do go awry, contingency planning is also an important classroom management skill. Should required resources not be available when needed, satisfactory alternatives must be provided in order to avoid instructional paralysis, confusion, and frustration.

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FLEXIBILITY/INDIVIDUALIZATION
(TABS Items 28 and 30)

FLEXIBILITY/INDIVIDUALIZATION can be defined as the instructor's skill in recognizing and dealing with the differing abilities and interests of students in his/her class. Ensuring that each student is given some opportunity to master the material according to his or her own learning style is a central principle in individualizing instruction.

The Learner

Learners enter an educational environment with complex individual differences or those "distinct characteristics which each learner brings into the learning situation and which inevitably interact with the distinct variables of each learning task" (Newsom, p. 388, 1972). These "distinct characteristics," according to Cross and Fields (1974), are "those mental abilities, physical characteristics, personality traits, cultural backgrounds, interests, motivations, behavioral and response mechanisms that make each person unique."

It is unlikely, therefore, that all of the students in a given class will solve a problem in the same way. However, it is highly likely that most will solve the problem given enough time, sufficient motivation, and an appropriate instructional mode. A critical factor in determining the extent to which material is mastered by the learner is the interaction between his/her individual characteristics and the nature of the learning task.

Several typologies have been generated to describe the differences that exist among learners in styles and processes of learning. Mann (1970) describes learners according to their orientation toward tasks, their socialization activities, and their interactions with teachers and other students. His resulting taxonomy includes: 1) compliant students, 2) anxious dependent students, 3) discouraged workers, 4) independent students, 5) heroes, 6) snipers, 7) attention seekers, and 8) silent students.

A somewhat less evaluative typology has been devised by Grasha and Riechmann (1974) that defines "six student learning styles based on students' attitudes toward learning, their views of teachers and peers, and their reactions to classroom procedures" (Bergquist & Phillips, 1975, p. 214). The six styles describe learners as some combination of competitive, collaborative, avoidant, participant, dependent, and independent.

A third distinction among learners is explained by Wilken, et al. in terms of "cognitive styles" or the extent to which each individual is dependent on the variables within the environment in order to solve a given problem. Briefly, students who utilize a field-independent approach are said to be more analytical, imposing their own structure on data in order to solve a problem. Those who are field-dependent tend to look for existing structure within the content. The authors point out that no individual is entirely

field-dependent or -independent. Instead, the two classifications represent opposing ends of a continuum on which no learner occupies either of the extremes. Although it appears to be possible to teach field-dependent individuals to be more field-independent, there are, as yet, no tested methods or techniques for doing so.

Another method of identifying student learning styles is known as "Cognitive Style Mapping." Developed at Oakland Community College, this system types individuals according to the ways in which they "acquire knowledge and derive meaning from their environments and personal experiences." Upon completing a lengthy questionnaire, the learner is informed of the predominance of various elements in his/her cognitive make-up: symbolic orientation, cultural determinants, modalities of inference, and educational memory.

Implications for the Instructor

"Teachers are potentially the most sensitive, flexible and responsive components of any instructional system" (Johnson and Johnson, 1970, p. 4). If instruction is to be individualized, the instructor must indeed be flexible in the use of teaching methods. Options for individualization range from simply offering a range of project choices to implementing a completely independent learning system such as the Keller Plan. For instruction to be completely individualized, "the learning activities (should) allow for unlimited choice of content and method, and (be) tailored to the individual learner" (Goldschmid & Goldschmid, 1973, p. 18). However, for instructors not wishing to individualize courses to this extent, many options are available. There are three major degrees of individualizing instruction:

1) Contract Learning
   Contracting involves the negotiation of content, methods and/or evaluation processes between the instructor and an individual student. Under a system of complete contract learning, the student is free to choose areas of study that s/he finds interesting and valuable, to determine methods for conducting that study, and to set and evaluate his/her own achievement. The instructor imposes little structure on the learning experience beyond the giving of advice, feedback, and suggestions. Within the format of a regular course, an instructor might use less extensive forms of contracting. For example, in contract grading, the student selects the grade for which s/he would like to work and contracts to do a set amount of work. The nature of the work itself might be determined by the student, selected by the student from among instructor-generated alternatives, or completely predetermined by the instructor.

2) Modular Instruction
   In the various forms of modular instruction, the instructor provides alternative instructional units which students choose and work through in order to gain mastery of specified material. This approach is characterized by frequent and immediate feedback to the student, self-pacing, and a limited choice of content. The instructor monitors the progress of the individual student as s/he works through the series of units or modules. Approaches in this category include the Personalized

System of Instruction, Computer-Assisted Instruction, and Auto-Tutorial Instruction. In most instances, modular self-paced units are coupled with lecture sessions, small group discussions, peer tutoring, or oral testing situations.

3) Instructional Options
Within this category fit those approaches that involve lesser degrees of individualization. Within the context of a traditional course, students are required to make choices about content, evaluation procedures, or activities. For example, an instructor may offer no options for students in content, but may allow students to design individual projects or select from among a variety of alternative learning activities. Instructional options also refer to the inclusion in courses of activities allowing for individual participation such as small group activities, role-playing, simulation games, and individually determined topics for term papers or projects.

(For additional details on these methods, see VARIETY and STUDENT PARTICIPATION.)

Effects of Individualized Instruction

Goldschmid and Goldschmid (1973) studied the use of four options in an undergraduate psychology course. The options offered were discussion, seminar, "the learning cell" (in which students work in pairs), and independent study. The following findings indicate the results of offering such options: 1) "Morale was high on all four options," and 2) "An overwhelming majority of students indicated they wished options such as these were available in all their classes" (p. 17).

While it is clear that students prefer options of this nature, there is no substantial evidence that individualized instructional techniques result in greater learning for the student. However, the benefits that accrue in terms of student satisfaction and involvement in the learning process should be considered. The purpose of such approaches may be simply to free both instructor and students from traditional teaching-learning activities in order that they can engage in more meaningful interactions based on individual abilities and clear goals.

The Teacher's Role

Traditionally, the teacher has been a dispenser of information. S/he has not been extensively involved with individual students in the classroom beyond the asking and answering of questions. This role must change for instruction to be individualized. The teacher must act out of a real interest for individual students, obtain a clear notion of students' capacities and desires, plan accordingly, maintain flexibility, and learn new instructional techniques in order to become skilled in whatever approach to individualization that s/he chooses to implement.

The Student's Role

Since the instructor has traditionally been a disseminator of information, the student has been a passive receiver. Due to years of experience in this mode, it is reasonable to assume that students will have as much difficulty with individualized approaches to learning as the instructor has with their implementation. Individualized approaches demand that students take an active part in their learning experiences, occasionally even directing and planning those experiences. Instructors will need to recognize that active learning may initially be difficult for students and plan activities that will assist students in changing their own behaviors.

Summary

Instructors who have individualized their courses report that the initial planning and implementation of any approach to individualized instruction is difficult and occasionally time consuming. However, as one gains facility at the use of the techniques involved and completes the development of new materials, preparation time drops significantly and the instructor is able to provide maximum learning experiences for the various types and levels of students in his/her classes.

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INTERPERSONAL RELATIONS
(TABS Item 31)

"Do any of you have another way of looking at this problem?"

"Excellent, John, your experience does tend to raise questions about the author's solution."

The instructor's ability to relate to students in ways "which promote respect" (TABS Item 31) refers to the establishment of a classroom atmosphere in which students feel supported, encouraged, and assured that their experiences and opinions are valued. When teachers relate to students in this way, it suggests a belief in human potential, and more specifically, in the idea that learning takes place best in a non-threatening setting where students can vigorously interact with new ideas. One of the most frequent problems in developing positive INTERPERSONAL RELATIONS in the classroom is that instructors and/or students misperceive the effects of their behavior on others in the class. For this reason, an outside observer is particularly useful in assisting an instructor to accurately assess the tone of classroom interactions.

Recent research and literature addressing classroom teaching indicate that a positive classroom atmosphere may be one of the two or three most critical variables influencing student achievement. Learning theorists tell us that the presence of feeling tone in a classroom or in other teaching/learning relationships influences retention (Hunter, 1967). Learners remember best those things associated with pleasant or unpleasant feeling tones, while information with no associated feeling tone is remembered least. However, virtually all researchers are agreed that learning environments which feature unpleasant feeling tones have unintended negative consequences for the learners (e.g., a distaste for the subject matter, avoidance of the learning setting, etc.).

Several studies have reported that students value the respect of their professors. When asked retrospectively to list the activities of those professors who make a difference in their undergraduate educations, alumni in one study reported qualitative and respectful interactions with professors in and out of class as having had significant impact (Wilson & Gaff, 1975). Alexander, Elsom, and Means (1971) reported that college students achieved higher scores in a class in which they received personal attention (the instructor learned their names, initiated before and after class conversations, and formed classroom relationships with students) than a control class that de-emphasized these same aspects. In another recent study, 129 random students at the University of Massachusetts/Amherst ranked "Whether the instructor shows respect for students" second (96.9%) among a list of 13 descriptors they would like to see published in a future Course Description Guide (Magid & Thomas, 1976). As students get older and develop more unique personalities, learning styles, and interests, affective behaviors of teachers appear to assume more and more importance in determining the effect of instruction (Good, Biddle, and Brophy, 1975).

Sensitivity to the individual ways in which students seek, process, absorb, synthesize and critically appraise information would be common to those professors wishing to encourage an atmosphere of mutual respect. Such behavior should never be confused with lack of academic standards. Standards would be maintained, but diverse and alternative methods to achieve those standards would be employed. The promotion of mutual respect might also mean the creation of a collaborative rather than competitive classroom. There are, of course, innumerable other ways in which a professor can convey positive stances toward students. The following list is suggestive, but far from exhaustive, of methods that have been used. The instructor might:

--reward student responses with recognition or praise;
--ask students to share the thinking processes by which they arrived at answers;
--pre-test the learners and offer individual learning activities to those who have demonstrated prior knowledge of material;
--notify students of personal biases operating in the subject matter;
--offer viewpoints other than one's own for a balanced picture;
--be ready to modify or abandon lesson plans should a burning issue in the lives of students surface and require discussion;
--design evaluation alternatives e.g., oral essay, projects, media presentations, etc.
--ask students what they want to learn and incorporate their goals into assignments and presentations:
--make a special effort to let stude know of one's availability for personal consultation;
--distribute classroom power and decision-making among instructor and students;
--paraphrase or build on student comments;
--learn students' names;
--encourage expression of disagreement with one's own views during class;
--ask for periodic student feedback about the teaching;
--make course objectives clear at beginning;
--provide opportunities for student collaboration in class, e.g., problem-solving or project groups;
--discuss grades/grading with students.

In conclusion, study after study of effective college teaching lists as critical an ingredient variously described as interpersonal relations, rapport, generosity of spirit, interest in students, flexibility, or warmth. Promoting mutual respect is another way to describe this factor. It includes the amalgamation of assumptions, values, attitudes, and behaviors by which a professor conveys to the students that their experiences and various learning styles are significant factors in the classroom.

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LEARNING ENVIRONMENT
(TABS Item 32)

In trying to determine what constitutes effective teaching, researchers have attempted to show that certain characteristics of the classroom affect student achievement. While little proof of causal relationships exists among environmental variables and various measures of achievement, certain correlations have been found. For example, "Anthony (1968) . . . found an association between environment and classroom average achievement" (McNeil and Popham, p. 232, 1973).

The learning environment consists of "a complex system of determinants that may be factors of social, physical and intellectual significance" (Sinclair, et al., 1973). These three aspects of the learning environment contain "conditions that promote or hinder, stimulate or inhibit, the characteristics of a living being" (Dewey, 1916, p. 1). The intellectual aspects of the learning environment include the course content, study and evaluation procedures, and intellectual interaction between the student and instructor. Social aspects include performance pressures working on the student from peers, parents or students, needs for acceptance, and the presence or absence of threat in the classroom. In discussions particularly, creating a "safe environment" for sharing one's views and feelings is a major task. Also included here is the relationship the students and instructor share outside the classroom. Physical conditions in the learning environment include lighting, temperature, size of the room in relation to the number of students, and the amount and condition of equipment and materials.

Establishing an Environment that Actively Supports Learning

Wilson and Gaff, et al. (1975) note that a "rich educational environment" is one "in which a wide range of learning experiences is offered, individual students and teachers are treated with regard for their unique interests and talents, and productive and humane interaction between students and teachers occurs on a regular and continuous basis." (p. 78). The following characteristics can be drawn from this statement to serve as guidelines in the establishment of an environment that actively supports learning.

1) A Positive Learning Environment Provides for a Variety of Learning Experiences
   Learning experiences in this context include activities and resources that the learner utilizes to gain knowledge or skill in a content area. Ravindra Kumar (1963) notes that availability of stimuli is a critical factor in the educational environment. It is the range of learning experiences within the context of the classroom that provides varied stimuli. One purpose of the learning environment, then, is to offer the student the stimulus to learn.

2) A Positive Learning Environment is Built on Mutual Respect Between the Teacher and the Students
   When Wilson and Gaff refer to the regard students and teachers should have for the "unique interests and talents" each possesses, they refer

to the skill of mutual respect (see INTERPERSONAL RELATIONS). There are two sides to this social factor in the learning environment: one is the relationship between the teacher and student(s), the other the relationships or atmosphere that exist between or among the students. In order for this regard to be in evidence, the support for each individual in the classroom must come from every other member of the group. The instructor needs to treat the students as individuals with talents and capacities, and the students must treat the teacher and each other in like manner. The result is a supportive atmosphere in which ideas and values can be shared and examined to the benefit of all. Also involved in the social aspect of the classroom, and in the skill of mutual respect, is the role the teacher chooses to take in the class. If the teacher chooses to be a "facilitator," or guide whose purpose is to help the students discover new ideas and knowledge, a certain set of behaviors is needed to achieve that goal. If the instructor chooses to maintain a stance of authority, mutual respect is not excluded--the teacher is merely in charge, and can still welcome student input according to his or her preference.

3) A Positive Learning Environment Provides for Interactions Between the Teacher and the Students Both In and Out of the Classroom

Findings of research "designed to study how various aspects of the college experience affect student development and change" (Wilson & Gaff, 1975, p. vii) indicate that a major factor in the institutional learning environment is the interaction of the student and teacher. The authors state that the small colleges, as well as sub-colleges which "clustered like-minded students and faculty in a supportive environment" contained more of the factors which resulted in student-faculty relationships than did the "larger, undifferentiated parts of the same universities" (p. 179). They note as well that these interactions are both personal and intellectual in nature, and the two aspects are important to the maintenance of a supportive learning environment. These interactions, where they exist and are productive, can provide for both a social and an intellectual requirement of the learning environment.

Sinclair (1973) notes that being accepted by the teacher is a part of the social aspect of the learning environment. Personal interaction between student and teacher, then, is an important part of the maintenance of an atmosphere that actively encourages learning. Intellectual interaction provides both the personal contact and the opportunity to help the student come in touch with his or her abilities, as well as the chance for the instructor to support the student's instructional efforts. It is important as well to restate Wilson's conclusion that this interaction should take place "on a regular and continuous basis."

Summary

In determining how to provide a rich educational environment the instructor should pay primary attention to the intellectual, social, and physical factors within the classroom as well as to teacher-student relationships. The

educational experience provided by the teacher should offer a variety of learning experiences, be supportive and respectful of individual differences, provide personal interaction, and by physically comfortable. As there is little proof of causal relationships among these variables and student achievement, few methods can be said to be more effective than any other. It is therefore up to the personal style of the instructor and the size and type of class to determine how these factors can be translated into action.

There are a number of skills that relate to establishing a supportive learning environment, including CREATIVITY, VARIETY IN METHODS AND MATERIALS, INTERPERSONAL RELATIONSHIPS, STUDENT PARTICIPATION, LEVEL OF CHALLENGE, and PERSPECTIVE. While these skills are not a prerequisite to improving the environment in one's class, they may affect, or be affected by that environment. It may be that the relationships among them will facilitate improvement in related areas.

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ENTHUSIASM
(TABS Item 33)

ENTHUSIASM refers to the instructor's skill in communicating to students his/her interest in the course content and in the students themselves. The positive effects of enthusiasm on student achievement and satisfaction have been well documented in both correlational and experimental studies (Coats & Smidchens, 1966; Mastin, 1963; Rosenshine, 1971).

ENTHUSIASM can be conveyed in a variety of expressive behaviors. Ware and Williams (1975) found that the following behaviors and attitudes, described as "highly expressive," were associated with increases in student achievement and satisfaction with instruction:

a. stresses material that s/he thinks is important because s/he is concerned that students will understand,
b. feels responsible for whether students end up knowing the material or not,
c. feels that part of teaching is keeping the students' attention,
d. is concerned about the effects s/he has on students,
e. is interested in the subject,
f. uses humor and attention-getting examples to "sell," his/her subject,
g. wishes to stimulate thinking and enthusiasm about the subject regardless of the students' academic goals.

In contrast, Ware and Williams described the "low expressive" instructor as one who did not care whether his/her teaching was enjoyable, who did not feel responsible for generating student attention or interest, and who viewed teaching as merely a job to be done.

As suggested by Ware's list, an instructor does not necessarily have to be a charismatic, energetic, enthusiastic person to generate students' interest in course materials and activities. A well-timed movie, an outside speaker, a game or simulation, or other forms of instructional variety can be used to maintain student attention and generate interest in the subject at hand. A sincere concern for the subject and the students can be communicated in the way in which a course is designed, the interactions that occur between the students and the instructor, and the level of preparedness exhibited by the instructor. Not only the dynamic quality of the instructor's presentations but also the attitude that s/he communicates toward the subject and the students are key variables in determining the expressive impact of instruction.

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PERSPECTIVE
(TABS Items 34, 35, and 36)

PERSPECTIVE is defined as the instructor's ability to establish a frame of reference for source materials and beyond that, to encourage students in developing processes of intellectual inquiry. In general, perspective means the instructor's ability to place the subject matter in a meaningful context within which students can comprehend, apply, and assess new learning. Perspective may be acheived by relating the subject to a variety of different contexts by:

a. establishing a relationship between the specific subject matter and the larger discipline from which it is drawn;
b. establishing a relationship between the subject matter's discipline and other academic disciplines;
c. establishing a relationship between the subject matter and real world situations, problems, or uses; and/or
d. establishing a relationship between the subject matter and the previous experiences or prior knowledge of the individual students.

Reasons for Establishing Perspective

Establishing perspective contributes to the retention, comprehension, and application of information by students. Ausubel (1963) stresses the importance of providing subject matter that is meaningful a) to increase motivation for learning; b) to create maximum learning by linking new learning to prior learning; and c) to promote retention. Providing appropriate perspectives for subject matter is one way in which the instructor can render material meaningful. Bruner (1969) underscores the necessity for this in his book The Process of Education.

> Teaching specific topics or skills without making clear their context in the broader fundamental structure of a field of knowledge is uneconomical in several deep senses. In the first place, such teaching makes it exceeding difficult for the student to generalize from what he has learned to what he will encounter later. In the second place, learning that has fallen short of a grasp of general principles has little reward in terms of intellectual excitement. The best way to create interest in a subject is to render it worth knowing, which means to make the knowledge gained usable in one's thinking beyond the situation in which the learning has occurred. Third, knowledge one has acquired without sufficient structure to tie it together is knowledge that is likely to be forgotten. An unconnected set of facts has a pitiably short half-life in memory. Organizing facts in terms of principles and ideas from which they may be inferred is the only known way of reducing the quick rate of loss of human memory. (pp. 31-2)

Perspective, like most teaching skills, is not discrete. Rather, it is related to skills such as ESTABLISHING A LEARNING SET, LOGICAL ORGANIZATION, and LEARNING ENVIRONMENT. It is suggested that these other skills

be consulted in conjunction with PERSPECTIVE. For example, when beginning a new topic of study, the instructor should consider introducing activities or information that will assist students in relating the new learning to the various perspectives mentioned above. Providing perspective is also one way of maintaining a positive atmosphere in which learners are encouraged to not only remember new information but also to question, disagree, or evaluate new learning in light of prior experience or knowledge.

Ways to Establish Perspective

When selecting subject matter, an instructor should consider its relevancy to the audience to which it will be presented. To meet the needs of the student who will be learning the subject matter, the instructor might consider the following factors:

a. the interests and motivations of students;
b. the educational backgrounds of students;
c. the demographic backgrounds of students, e.g., age, socio-economic class, etc.;
d. the political and cultural environment of the larger society of which students are a part;
e. current events on the local, national, and international scene; or
f. the relationship of content to relevant concepts, knowledge, or experiences that students already possess.

Pretesting and/or surveying students over a number of semesters can provide the instructor with a valuable data base on which to determine the selection of course content and activities. The interest that students will take in the subject matter is a function of these factors (Gage & Berliner, 1975). Consequently, an instructor should carefully select subject matter and activities that will ultimately provide the most meaningful and useful learning experiences for students.

This is not to suggest that only that material immediately relevant to student needs and interests should be included. Rather, the role of the instructor should be to point out to students, as frequently as is necessary, present as well as future possibilities for the application of content or skills to be learned. If the instructor cannot envision any situation in which such learning would be relevant to the personal, academic, or professional lives of students, then the inclusion of that material might itself be called into question.

Several instructional methods have been shown by Ausubel (1963) to optimize the learning of material once it has been placed in appropriate contexts:

a. the use of statements or activities PRECEDING instruction that indicate the framework within which the new learning can be organized by the student;
b. the presentation of more global, general, and inclusive ideas BEFORE the fleshing out of details;

c. the deliberate and explicit pointing out of similarities and differences between newly presented or encountered ideas and those previously learned; and
d. testing for mastery of newly learned material before introducing new learning, i.e. frequent graded and/or non-graded tests.

In addition, subject matter and materials should be presented to students in such a way as to fit into their pre-existing cognitive structures. This means that, initially, communications should incorporate vocabulary, reading materials, learning activities, etc., that are geared to the level at which students enter the learning experience. For example, to maintain perspective, examples and illustrations of general principles or concepts should be relevant to students and related to their life experiences. Through this technique, the instructor should be able to introduce increasingly difficult material without discouraging or frightening the new learner.

The methods listed by Ausubel are primarily didactic ways in which an instructor can achieve perspective. Other instructor-oriented ways to establish a context for new learning include a) team teaching; b) trans-disciplinary approaches to subject organization; c) the use of primary data sources such as newspapers, documents, and magazines in place of textbooks as instructional materials; and d) the inviting of guest speakers from across the campus, community, or professional spectrum into the classroom.

Learning activities that directly involve students in discovering appropriate perspectives include:
a. role playing;
b. simulation and gaming;
c. debates and panel discussions;
d. field projects;
e. field trips;
f. journal or diary writing; and
g. problem-solving activities.

Such activities are primarily student-centered. With the appropriate structuring, active involvement of students with content in relevant situations encourages learners to probe various points of view and to recognize the legitimacy of diversity of opinion--in short, to develop inquiring mental processes.

Summary

In conclusion, establishing perspective is an important ingredient of meaningful learning. The instructor's ability to select and design learning experiences that provide perspective increases the students' potential for learning and retention. In addition, by clarifying the contexts in which new learning may be utilized, the instructor can encourage students to move beyond the sheer memory of information to the formulation, application, analysis, and evaluation of ideas.

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VALUE CONTEXT
(TABS Items 37 and 38)

One way for learning to go beyond the accumulation of facts to make a difference in students' lives is to provide for the deliberate treatment of value questions in teaching. VALUE CONTEXT refers to the instructor's inclusion of opportunities for students to clarify and make decisions about value laden issues within the subject matter of a course.

Students have traditionally come to college to develop a philosophy of life. This is no less true for today's students (Astin, King & Richardson, 1975). What has changed is the world from which they come--a world of post-industrial complexity, of the decline of the impact of orthodox religion, and of the growth of ethical and intellectual pluralism. According to the research of William G. Perry Jr. (1968) of the Harvard Bureau of Study Counsel, students of the past have clustered at the dualism extreme of a dualism-relativism continuum. Contemporary students, by contrast, have moved toward the middle of this continuum. (See figure 1.)

Figure 1
Developmental Stages of Thought and Value Forms: The Positions of the Perry Scheme of Student Development

Commitment	Relativism	Dualism
Evolution of personal commitments; exploration of personal responsibility	Breakdown of dualistic framework; substitution of relativistic framework; intimation of challenge of personal commitment as a necessity of orientation and identify in a relativistic world.	Elaboration of dualistic framework; recognition of authority; classification of knowledge into set dualities such as right or wrong.
Students 1975	Students 1958	Students 1953

Adapted by the author from "An Analytical Framework for Planning and Research in Higher Education," J. Heffernan, Liberal Education, December 1975, p. 497.

Matters that for past students were "black or white" are, for today's students, shades of gray. Because of their increased relativism, students experience much value confusion. The instructor's provision of a value context in the classroom can facilitate student decision making about personal values and subject matter values as well.

From a valuing process a student can gain clarity in the determination of what one stands for and how one should act. Values give life meaning and direction. If the unexamined life is, indeed, not worth living, college classrooms should be a place, along with the dormitory and playing field, where values are discussed and tested, rejected or affirmed (Feldman & Newcomb, 1969).

The acquisition of values, however, is not a simple matter of transmission from teacher to student in the usual way that course information is transmitted. Although students learn from adult role models, including their professors, such learning is often described as incidental. Values, unlike facts, do not transmit nor can they be taught. They can only be learned (Simon, 1974). The instructor's creation of a value context means building a classroom climate where values are not shortchanged.

Personal Values

"The instructor's performance in helping me explore the relationship between my personal values and the course content" (TABS Item 37) calls for an instructor to build into the course design a number of exposures to important value issues in the subject. At key points students can be asked to judge, argue, give opinions, evaluate, decide, consider, compare, contrast, appraise, and weigh options (Metfessel et al., 1969). By providing training exercises in how to select the best, how to reject the worst, how to prioritize, how to consider trade-offs, consequences and implications of the subject matter, the professor is consciously planning what may be occurring unconsciously. Below are a few specific classroom activities that an instructor might include for the clarification of personal values as they relate to the subject:

--listing of individual student goals for the course;
--comparison of teacher goals with student goals;
--listing of course expectations, both teacher's and students';
--generating a class list of topics of interest;
--prioritizing topics of interest from the instructor's list of possible course topics;
--placing thinkers in the field on a continuum of contributions from "greatest" to "least";
--drawing sociograms of classroom interaction;
--debating pros and cons of an issue;
--role playing all sides of an issue;
--filling in a pie graph, weighting various components of a whole issue;
--problem-solving on problems that have a contemporary impact;
--problem-solving on age-old human problems;
--having a student take class notes on an overhead; discuss what was included, what was omitted and why;
--providing case studies.

Values in the Subject Matter

"The instructor's performance in making me aware of value issues within the subject" (TABS Item 38) calls for an instructor to highlight or merely

note questions of value in the subject as they arise. The provision of opportunities for the full treatment of such questions may be a part of the skill, also.

Every scientific and historically-oriented discipline is based on some implicit body of intertwined theoretical and methodological belief called a paradigm, which identifies the nature and limitations of research in that field (Kuhn, 1962). In addition, every academic discipline has its own questions of merit, worthiness, emphasis, ethics, and value. This is the stuff from which scholarly disputes within each discipline are made. Examples of current value issues are: a) the ethical responsibilities of scientists who make environmental impact statements; b) the criteria to be used in decisions of necessary but unattractive facilities such as refineries, prisons and airports; c) the value conflicts involved in the large scale exportation of agricultural technology to Third World countries; d) the role of anthropology in racism; e) the role of media and journalism in American politics; f) the role of statistics in data interpretation; g) the role of psychology in sexism; h) the role of literature in censorship. Professors in each academic discipline can easily come up with numerous examples of their own discipline-related value issues.

The point is that knowledge is generated by humans and humans bring at least a partial subjectivity to their objective decisions about classification schemes and problems worth researching. Jerome Bruner urges higher education to "no longer strike an exclusive posture of neutrality and objectivity" (Bruner, 1973). Knowledge needs to be put in a value context, in order to encourage the development of commitment and subsequent action on the parts of learners. The honest exploration of values guided by a person such as an instructor with a full grasp of the subject matter constitutes the most basic meaning of the word "education." A beginning list of ways to improve TABS Item 38 appears below:

--Asking questions that call for comparison;
--Asking questions that call for contrast;
--Asking questions that call for the statement of one's opinion;
--Role playing in which students take another's perspective, e.g., feminism from the perspective of editor of Ms., Journal of Developmental Psychology, Playboy;
--Providing sentence fragments whose completion demand evaluative positions from students, e.g., "I agree with Arthur Jensen because . . .";
--Listing or having students list pre- and post-course values.

The above lists are not exhaustive and are presented as a guide for an instructor to develop his/her own value exercises.

Instructor's Personal Values

A word should be said about an instructor's personal values. Try as s/he may to keep them hidden, one's personal values will ultimately reveal themselves. The importance one assigns to teaching; the amount of class

preparation; the grading, course and meeting options permitted; the kinds of exam constructed; the amount of time and depth given to various topics in the course; the selection of materials; the amount of time available to students outside of class; the solicitation of feedback on one's performance, etc., all of these are indicators of one's personal values.

Summary

The skill of providing a context for the exploration of values--both personal and subject-oriented--calls for the ability to take an implicit mental process and make it explicit. It seeks to answer "why," "ought," and "should" questions rather than "how to" questions. The value decisions an instructor makes are, and have been since the time of Plato, the foundations upon which other teaching decisions are made.

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